
Planning for the Mobile Home: Advisory Document

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*Parcs et lotissements: Conseils et
recommandations*



**Canada Mortgage
and Housing Corporation**

**Honourable Paul Cosgrove
Minister**

**Société canadienne
d'hypothèques et de logement**

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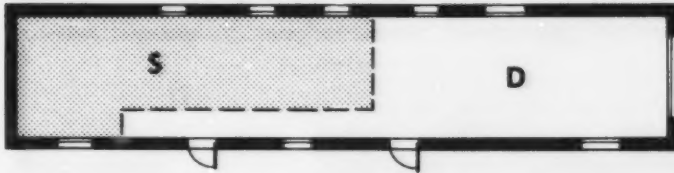
Preface

Canada Mortgage and Housing Corporation (CMHC), the agency responsible for administering the National Housing Act, has established recommended standards for the site planning of housing in the document *Site Planning Criteria* (NHA 5214). These standards apply to the site planning of all forms of housing development. The standards generally have advisory status for the Corporation's insured lending functions and are mandatory for social housing projects. Proponents should consult the local CMHC office in their area to confirm the status applicable to their project.

This document, *Planning for the Mobile Home: Advisory Document*, is intended to explain how the Corporation's recommended standards apply to the site planning of mobile homes and also promote the general improvement of mobile-home developments. Of necessity it covers a very broad subject in a general fashion. Other CMHC publications should be consulted for detailed discussion of specific topics.

The preparation of this document has been directed by John Archer, Projects Manager, Development Evaluation and Advisory Services Division, CMHC. The principal consultant was Pluram Inc., Quebec City, Serge Viau, Partner-in-charge.

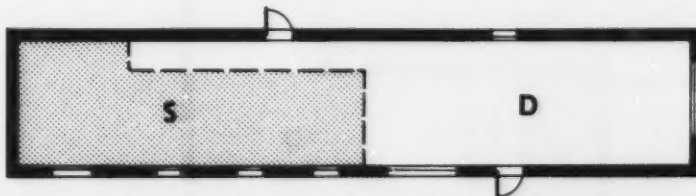
Introduction: The mobile home



Model 1 Doors on the same long side. The living room is at one end with the principal living-room window on the short wall. In certain models there are windows in the other short wall.



Model 2 Doors are on both of the long sides (reverse-aisle type). Bedrooms are at both ends. Usually the master bedroom is near the living room to which it is connected by a large archway. Principal living-room windows are on one of the long sides. Some models have a second living-room window on the opposite long side.



Model 3 Reverse-aisle model with all bedrooms in the same area. With only two openings on one long side (door and kitchen), greater privacy for the neighbouring lot is possible. With no windows on the short end of the sleeping area this model can be used in zero lot-line applications.

Early mobile homes were designed and built to be moved easily from one site to another. However, over the years mobile homes have become larger, wider and heavier. Today it is rare for a mobile home to be moved and it is common practice for owners to sell the mobile home on its lot. The site planning of mobile homes has, as a consequence, become increasingly important. Decisions made when the unit was originally set up must stand the test of a lifetime of use.

Mobile homes are available in a wide variety of sizes and interior configurations. They generally have three bedrooms, although shorter types may have only two bedrooms. They also come in "single wide" and "double wide" variations.

The single wide models vary in size from 3 700 mm to 4 300 mm in width, and from 14 600 mm to 22 500 mm in length. The two most popular sizes are 4 300 × 20 110 mm and 4 300 × 20 720 mm. Recently 21 370 mm, 21 940 mm and 22 550 mm long models have begun to appear.

In the following illustrations, sleeping areas are indicated with an "S", and dayrooms with a "D".

The double wide models are also three-bedroom units and their interior configurations are similar to those of conventional bungalows. They usually range from 6 700 mm to 8 330 mm in width, and from 10 970 mm to 18 300 mm in length.

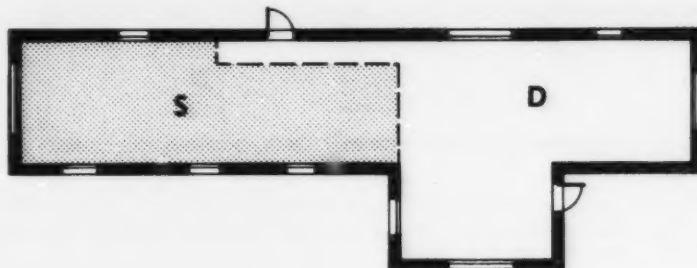
One of the most important preconditions affecting the mobile home's capacity to provide long-term shelter is that it be properly set up on a permanent foundation with secure anchoring. Section I of this advisory document provides information on the range of foundations and anchoring devices available, as well as basic advice on site development.

Section II discusses the siting of mobile homes on conventional lots. With the increasing acceptance of mobile homes by consumers there has been a corresponding increase in demand for sites in areas traditionally reserved for conventional forms of housing. The careful siting of the mobile home, as well as good landscape planning, will reinforce the residential character of the mobile home and promote its acceptance.

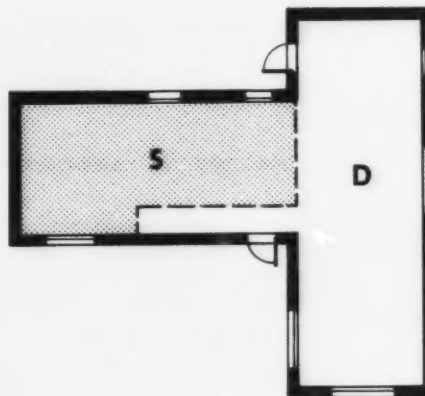
The application of comprehensive planning principles may make it possible to increase the density of mobile-home development. Section III discusses their application to the siting of standard mobile-home models. It also suggests the benefits which might be gained through the development of a new generation of mobile-home types.

Section IV addresses the problem of upgrading existing mobile-home parks. Many older mobile-home developments do not meet today's standards of appearance or housing quality. However, most of them can be upgraded. Section IV discusses a range of measures which may be undertaken to rehabilitate existing mobile-home parks.

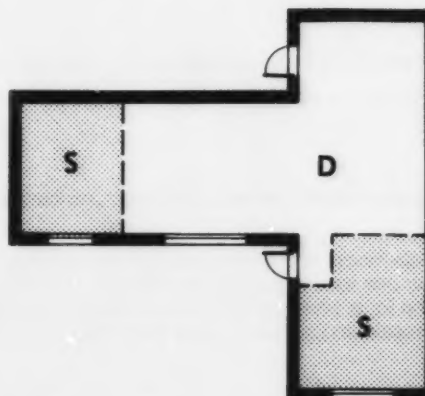
This advisory document is, therefore, very broad in scope. It is intended more to provide general advice on good site planning and site engineering than to provide a solution to every problem which may arise. In fact it is hoped that the primary effect of the document will be to raise general expectations about the quality of mobile-home development and, as a consequence, encourage the mobile-home industry to emphasize site planning and site development in its work.



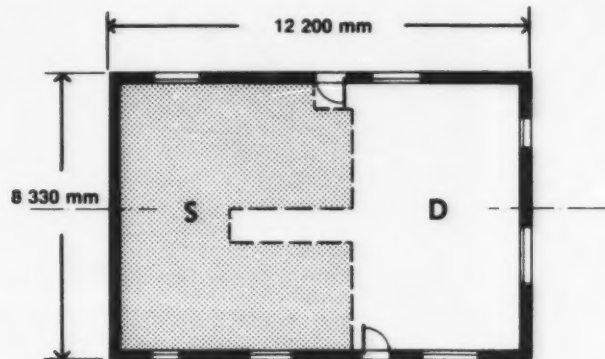
Model 4 Expandable model, where the living area is enlarged, may be standard or reverse aisle. The sleeping area may be concentrated at one end or separated as in model 2.



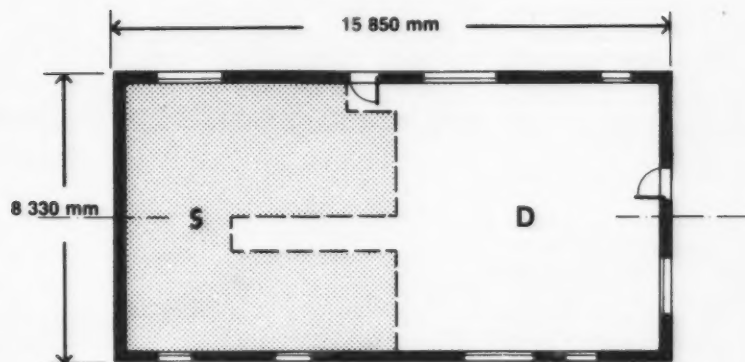
Model 5 T-shaped model not yet on the market. The sleeping area is concentrated in one part.



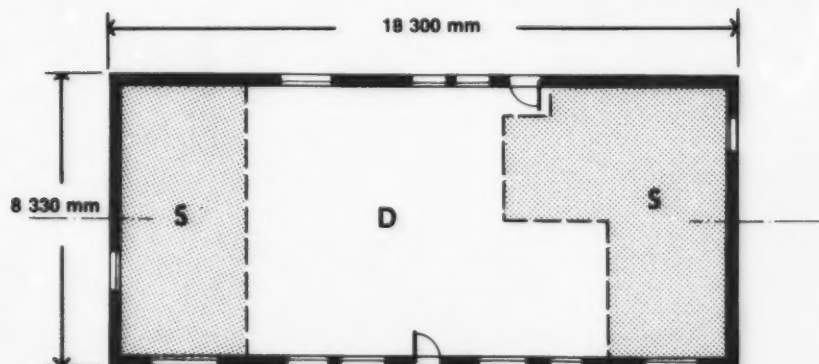
Model 6 Same as model 5 but with two separate sleeping areas. Again this model is not yet on the market.



Model 7 Small double wide model with doors on opposite long sides. The blank wall permits siting on small lots and in zero lot-line applications.



Model 8 Larger double wide unit. The main entrance is on the short side so that the unit can be placed with long sides parallel to the side yard lot-line.



Model 9 A very large double wide unit giving 154 square metres of habitable space. The sleeping areas are segregated. Entrance doors are on both of the long sides and windows are on all four sides.



Section I.

Mobile-home installation



Nonpermanent foundations invite long-term trouble.

Introduction

Purchasers of mobile homes are often responsible for their own site development and the installation of their unit. A consequence is that mobile homes are often improperly set up. Common faults are: an insufficiently prepared base, use of untreated posts or wood blocking, inadequate or non-existent anchoring, and skirting built with inappropriate materials. Sometimes the skirting is omitted entirely.

Typical problems resulting from these faults are sloping floors; cracked walls; air or water infiltration through windows and roofs; displacement or overturning of mobile homes in strong winds; corrosion; rot and other forms of moisture damage; and infestation from termites, rodents and other vermin. Failure to use appropriate materials and to prepare the site properly shortens the life of the mobile home, downgrades its appearance and the general appearance of mobile-home developments.

Mobile-home manufacturers have developed sound installation techniques which, if followed by the owner or the developer, will help maintain the security and the value of the mobile home. Yet these techniques are not widely accepted or understood. The purpose of the following section is to illustrate the technical aspects of mobile-home siting and emphasize the importance of good foundations, anchor systems and site preparation.

1.1 Preparation of the stand

Issue

Dampness and moisture rising from the ground can create conditions conducive to corrosion, rot and animal and insect infestation under the mobile home.

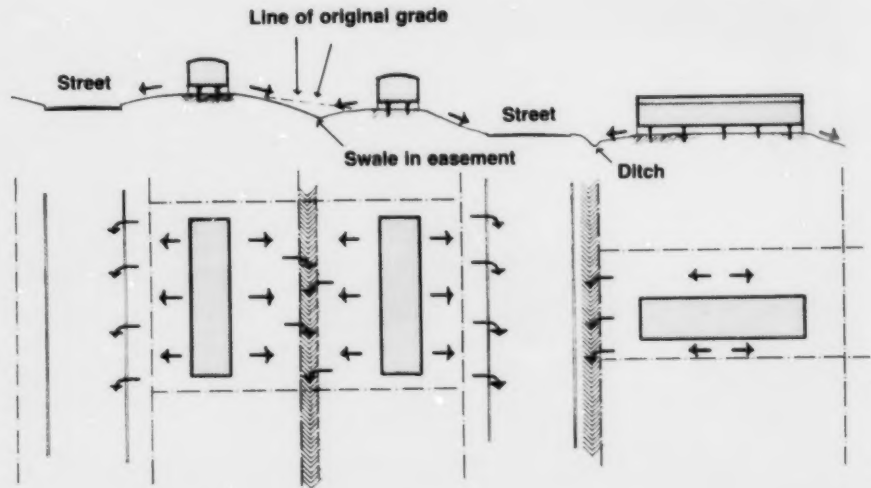
Discussion

Before installing the mobile home on its piers, a pad should be prepared which is designed to control rising damp and which directs surface water away from the unit.

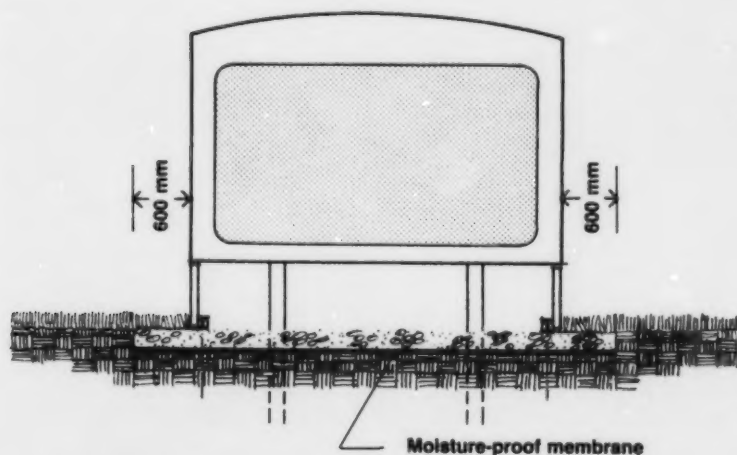
Design solutions

Before selecting a location for the pad, drainage conditions on the lot should be studied carefully. First, the pad should be placed so that storm-water runoff will not pond under the mobile home. Storm drains may be necessary. Second, the site should be graded so that surface water flows away from the unit. The level of the site in relation to the level of the street and neighbouring lots or terrain should be taken into consideration.*

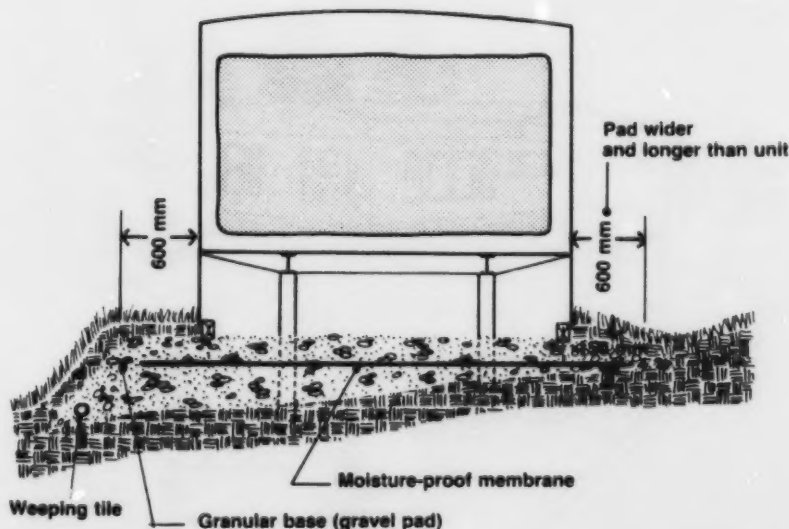
*See CMHC Information Pamphlets *Site Landscape for New Housing: Grading-Lot Drainage Pattern*, NHA 5176-3, and *Grading Details - Surface Drainage*, NHA 5176-7. (Ottawa: Canada Mortgage and Housing Corporation, 1980.)



Groups of mobile homes should be graded so that the run-off is collected in an organized pattern. One lot should not drain onto another.



Gravel pad on a level site.



Gravel pad on a sloping site. Weeping tile to control run-off on the up-slope side will be required unless positive drainage away from the unit can be achieved.

Preparation of the pad and the work of putting the foundations in place must be coordinated. The types of foundations which can be used are discussed in Section 1.2. One of the recommended foundations, the reinforced concrete slab-on-grade, does not require a gravel pad.

On steep lots, grading, together with retaining walls, can be used to control drainage, while at the same time defining outdoor areas by their function and improving privacy between mobile-home units. Raising the grade in front of the mobile home and installing a retaining wall at the skirting line give the unit an attractive appearance.

The mobile-home pad should be at least 600 mm wider and longer than the overall width and length of the mobile home. Grass, weeds, trees and shrubs should be removed and the area for the pad dug out to a minimum depth of 200 mm. After the foundations for the mobile home have been put in place, a layer of crushed stone or gravel (approximately 50 mm thick) should be spread over this base and raked level. On top of this bed the moisture-proof membrane (6 mil polythylene) should be laid. Finally, a thick pad of crushed stone or pit-run gravel with a minimum depth of 150 mm should be spread over this area and levelled. The pad must be protected from damage while the mobile home is being manoeuvred into place.

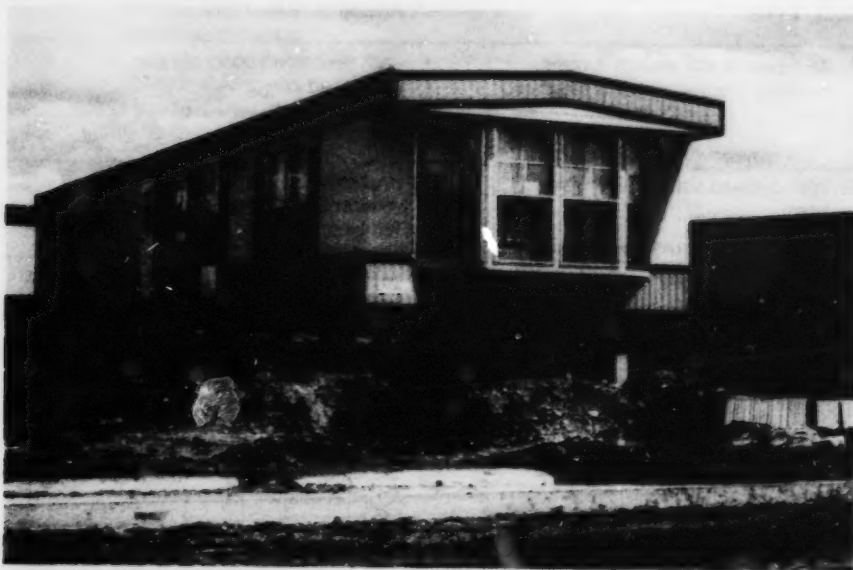
Underneath the mobile home a minimum clearance of 300 mm between the pad and the frame should be maintained in order to allow for maintenance. A minimum height of 600 mm is necessary between the utility connections and the skirt access door. The gravel pad should be protected from damage between these two points.



Where the mobile home is placed on a steep site, and is perpendicular to the slope, expensive site grading and earthworks will be required.



On sloping sites, level changes can be used to define areas around the mobile home.



Typical mobile-home installation on piers.

1.2 Foundations

Issue

The construction of a proper foundation is the most critical aspect of the mobile-home installation. A poor foundation will result in jammed doors, cracking walls, broken windows, air and water leaks.

Discussion

Generally, mobile homes are designed with two main carrying beams running lengthwise and supporting floor joists cantilevered to the perimeter walls. The carrying beams are usually designed to be supported at frequent, equally spaced intervals along their length. Because of their construction most mobile homes cannot be supported at the perimeter walls. To do so will result in structural failure.

Mobile-home foundations therefore consist of many individual piers. These piers can be constructed of a variety of materials, but in every case they should provide a **permanent** foundation – that is, they must be strong enough to hold the weight of the mobile home and everything it contains without collapsing or settling. They must remain stable despite difficult soil conditions in the area and the annual freeze/thaw cycle, and they must be able to perform all these things throughout the life of the mobile home.

Design solutions

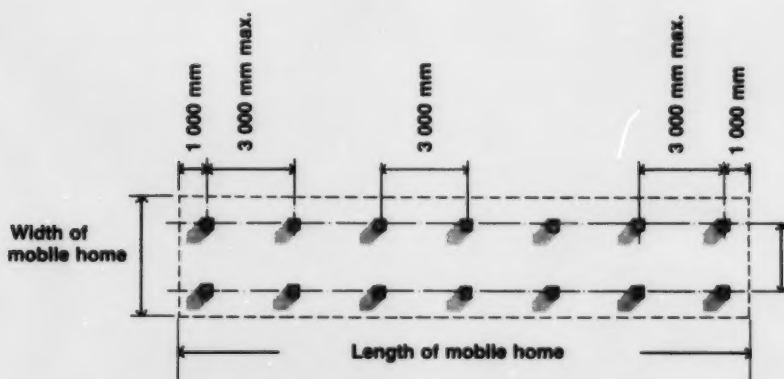
There are a variety of foundation types which can be suitable as permanent structures for mobile homes. Selection of a type appropriate for individual applications will depend on the area in which the unit will be located, the type of soil, the water table, the depth of frost penetration, the availability of materials and cost. It is highly recommended that the advice of a professional engineer or architect be sought.

Generally, footings-at-grade are not suitable for most areas of Canada.

SOIL TYPE	FOUNDATION TYPE
1. All types of soil except swamp, muskeg, permafrost and saturated clay	• cast reinforced concrete pier • reinforced concrete block • full basement • reinforced concrete slab-on-grade
2. Well-drained soils susceptible to frost	• pressure-treated wooden pier • reinforced concrete slab-on-grade • full basement
3. Well-drained soils not susceptible to frost	• reinforced concrete block with footing at grade • cast reinforced concrete pier with footing at grade • reinforced concrete slab-on-grade • full basement
4. Swamp, muskeg, permafrost, saturated clay	• consult a professional engineer or architect experienced in the design of foundations for these conditions.

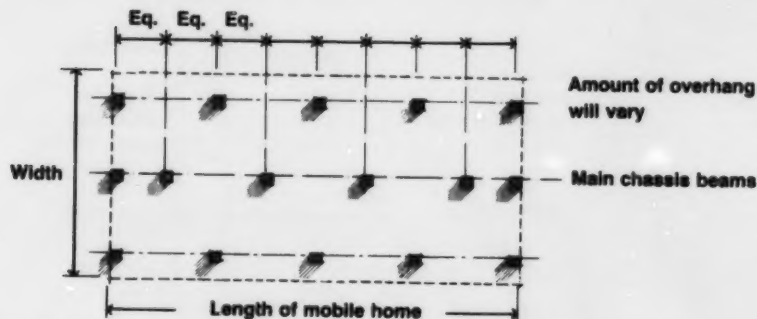
The requirements of *Residential Standards** should be used as the basis of foundation design.

*See "Footings and Foundations", *Residential Standards 1980*, NRCC 17304, (Ottawa: The Associate Committee on the National Building Code, National Research Council of Canada, 1980). See, in particular, Section 15.

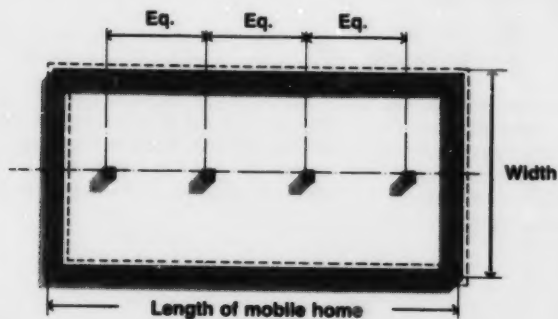


Generally the number of piers required depends on the overall length of the mobile home and the manufacturer's recommendations.

Piers spaced according to manufacturer's recommendations



Foundation plan for double wide mobile home designed to be set on piers.



Foundation plan for double wide mobile home designed to be set on perimeter foundations.

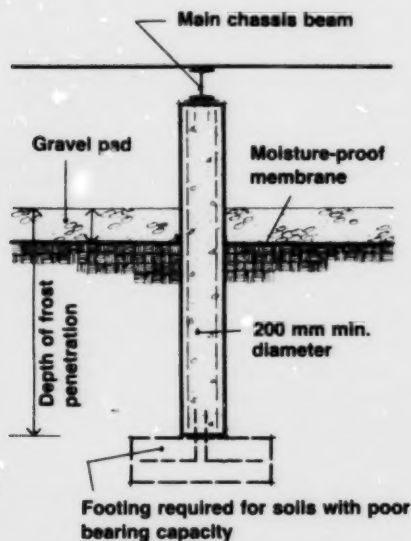
The set-up of double wide mobile homes resembles more closely that of conventional site-built houses, as some are designed to be put on a full basement foundation. Check with the manufacturer before selecting a foundation plan.

Generally a minimum clearance of 300 mm should be maintained between the underside of the main chassis beams and the pad. A clearance of 600 mm is required between the skirt access door and the utility connections.

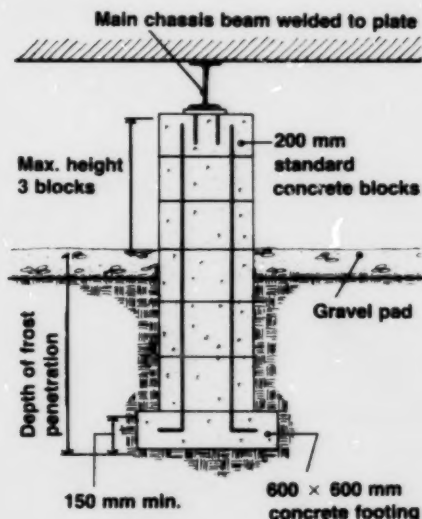
After installation on its foundations, the towing bar and running gear should be completely removed from the mobile home, and the main chassis beam welded or bolted to the foundation-bearing plate.

Ancillary structures and buildings must be supported on structurally stable foundations independent of the mobile home.

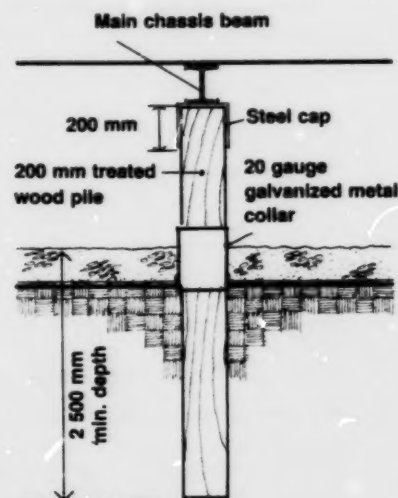
The foundation which has the most to recommend itself is the reinforced concrete slab-on-grade. The finished slab provides a stable dry platform onto which the mobile-home unit can be moved and set up with a minimum of difficulty.



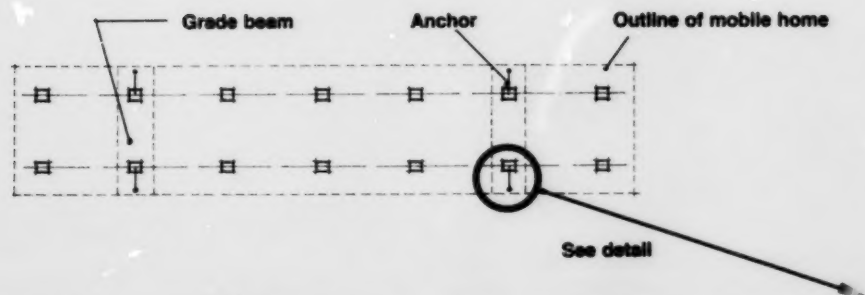
Cast-concrete pier reinforced with two no. 12 steel bars and capped with a steel plate anchored in the concrete.



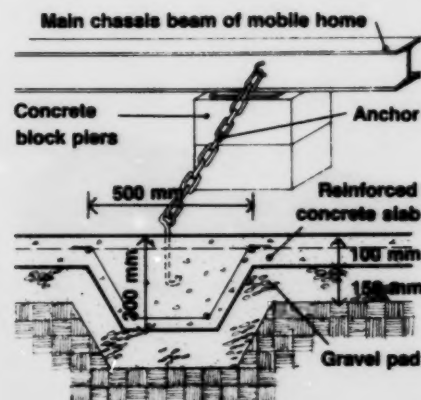
Concrete block pier reinforced with two no. 12 steel bars. The block cores are filled with concrete and a steel top plate is anchored down with 200 mm bolts.



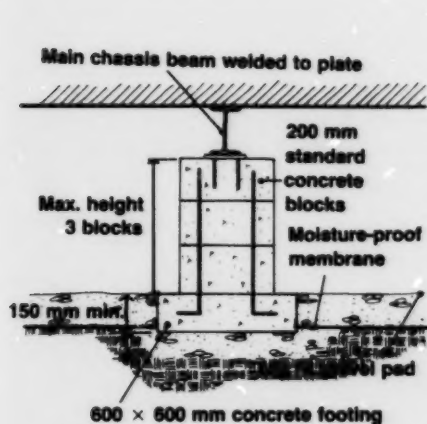
A pressure-treated wood pile can be driven into place or set in an excavated hole. The galvanized steel collar is important to protect the wood at grade. A "U"-shaped steel cap is bolted to the top of the pile.



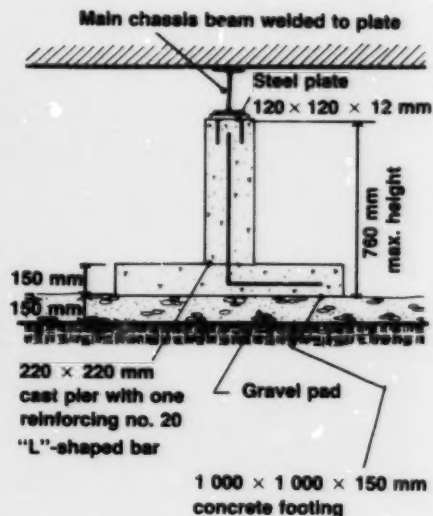
Reinforced concrete slab-on-grade. Grade beams running the width of the slab provide anchor locations for tie-downs. Check the utility and service locations before pouring the slab.



Detail of grade beam and tie-down for reinforced concrete slab-on-grade.

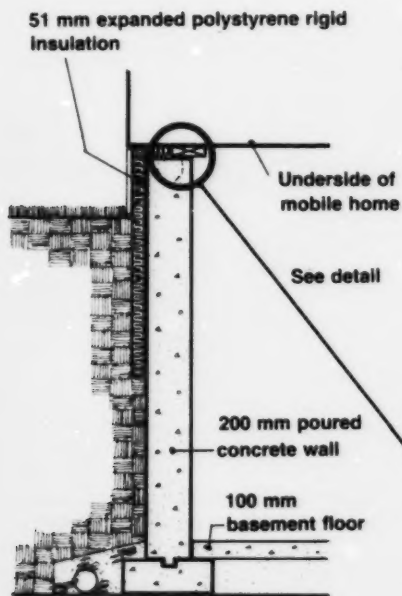


Concrete block pier with footing at or near grade. The piers are reinforced with two no. 12 steel bars and block cores filled with concrete. Anchor the steel top plate in concrete. The tie-down must not be fixed to the footing.

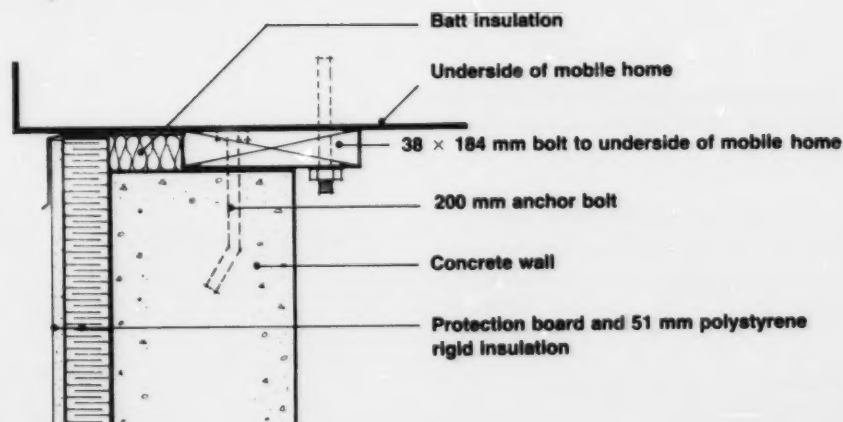


Cast-concrete pier and footing at grade, reinforced with one no. 20 steel bar and with a steel cap anchored in concrete. Pour concrete footing first and allow at least 24 hours to pass before casting the pier.

These foundation types are to be used only where there is no risk of frost movement in soils.



Except for the anchor detail, a full basement for a mobile home is the same as for site-built houses. However, special structural details are necessary in order to carry loads from the main chassis beams to the perimeter walls. Consult a structural engineer.



Where a full basement is built under units designed to be perimeter-supported, anchorage is provided by embedding or fastening a sill plate to the foundation with 12 mm min. diameter anchor bolts spaced not more than 2400 mm on centre.



Wind can cause great damage to mobile homes.

1.3 Anchoring systems

Issue

The long narrow shape of the single wide mobile home makes it prone to displacement or overturning in strong winds.

Discussion

Each mobile home must be anchored to resist gusting winds prevailing in the region where it will be set up. The National Building Code Supplement * provides regional requirements. In addition, it must be remembered that the shape of the surrounding terrain and tree cover can affect wind velocities, either increasing them such as at the crest of a hill, or decreasing them as in a sheltered valley. Because of the long narrow shape of the mobile home, strong winds can set up annoying vibrations within the unit. Sheltered locations are therefore to be preferred.

*"Climatic Information for Building Design in Canada," in *The Supplement to the National Building Code of Canada 1980*, NRCC No. 17724 (Ottawa: The Associate Committee on the National Building Code, National Research Council of Canada, 1980).

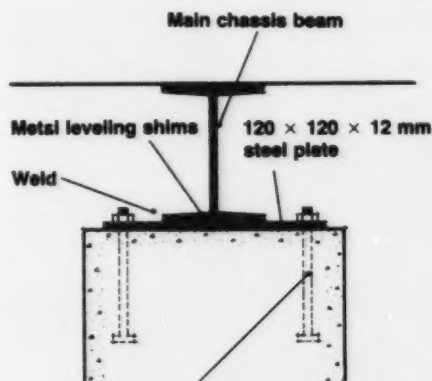
Design Solutions

All parts of the anchor system must be corrosion-resistant, i.e., generally hot-dipped galvanized, and be capable of resisting a pull-out force of 21 kN. Anchor rods and hooks should have a minimum diameter of 12 mm.

The anchors are installed adjacent to the blocking points (the foundation support locations) on the mobile-home frame. At least 4 anchor points should be within 1 000 mm of the unit ends.

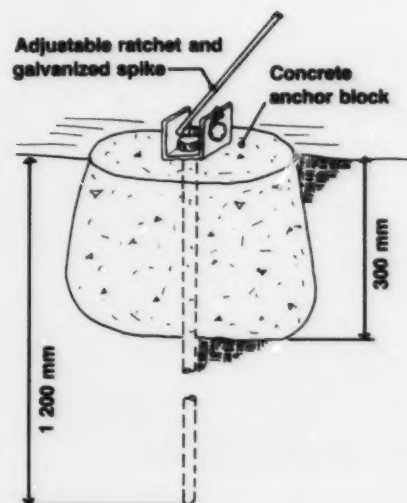
Turnbuckles and connectors must be of the closed-end type and each tie should be adjustable.

In areas with frost-susceptible soils or expansive clay, the tie-down cable must be adjustable to relieve the tension stress on the chassis frame should differential settlement occur. The tension on the cables should be eased a little in the fall and checked periodically throughout the winter in order to equalize stresses. The cables can be brought up to tension again in the spring.

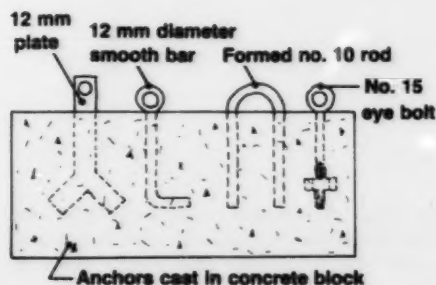


12 mm diameter bolts cast in concrete

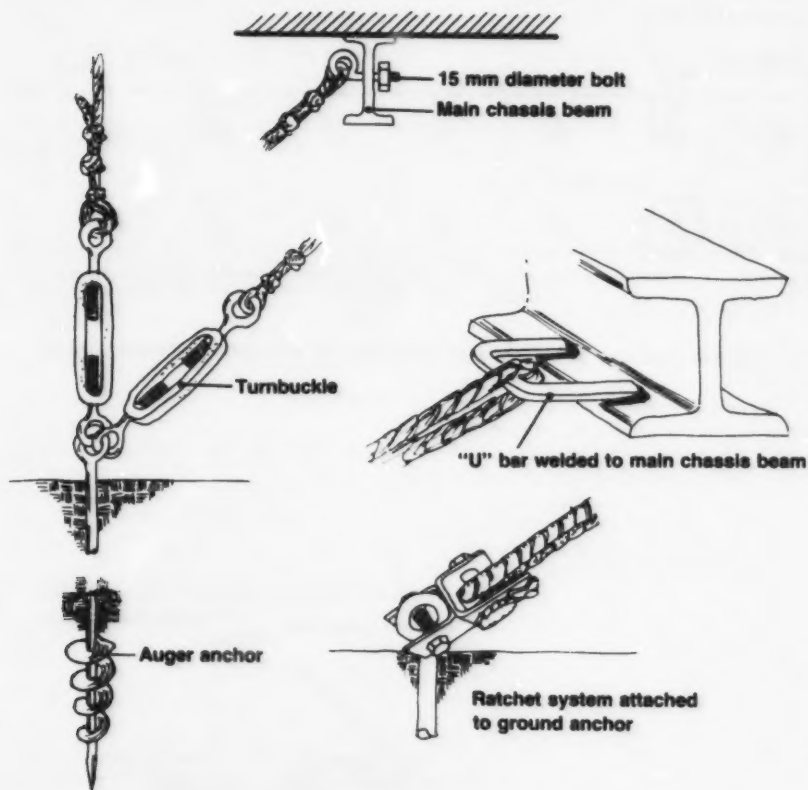
In sheltered areas enough resistance to overturning and displacement may be provided by welding the mobile-home frame to the steel bearing plates on top of piers or foundations. Only driven wood piles, cast-concrete or reinforced concrete-block foundations are suited for this application.



Concrete deadman with adjustable ratchet. Opportunity to adjust the tension is essential where there is a risk of frost movement.



Types of anchor hooks.

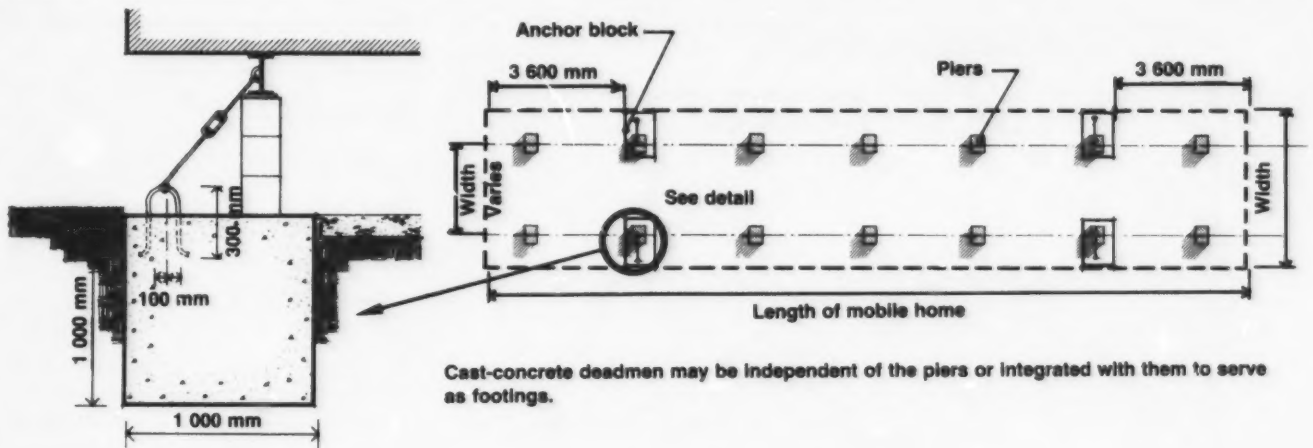


The number of anchor points required depends on the wind velocity in a particular location. The table below provides a general guide for a single wide mobile home.

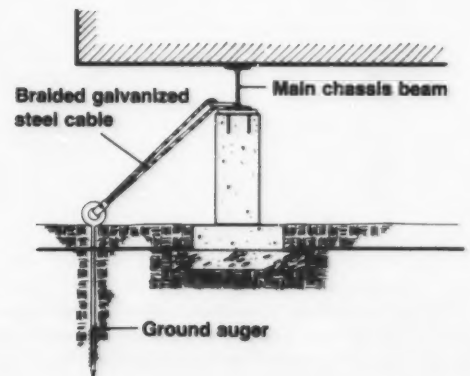
Wind velocity km/hour	Number of frame ties per side
0 - 112	4
112 - 128	5
128 - 144	7
144 - 160	8
160 - 170	10

Sheltered area	Frame welded to piers
----------------	-----------------------

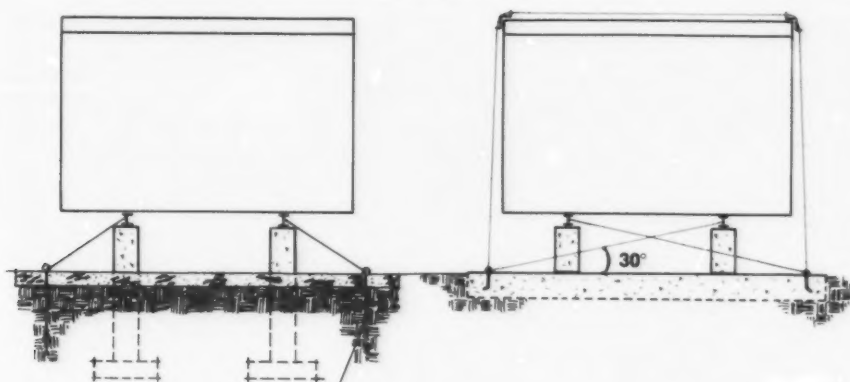
The ties in the form of anchor rods or cables may be attached to the ground by means of anchor hooks cast in concrete blocks, by means of earth anchors screwed directly in the ground, or by cross-connection to below-grade foundation piers.



Combined footing and anchor block.



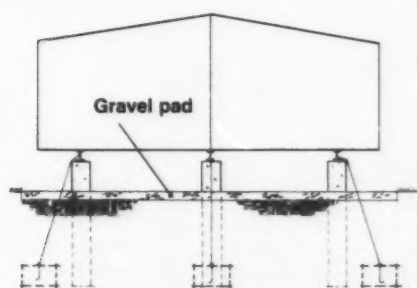
This type of anchor can be used where there is no risk of frost movement.



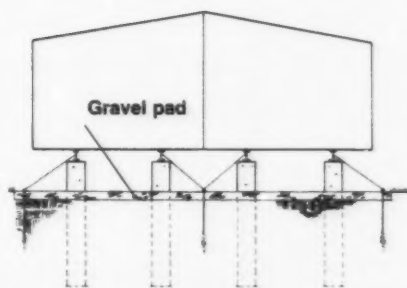
Earth auger

Single wide unit on piers with earth augers.

Some mobile homes are designed to be anchored with over-the-roof tie-downs and are provided with hardware at points designed to take wind loads. These tie-downs are not required on mobile homes conforming to the CSA Z240 series of standards and should not be installed without consulting the manufacturer of the unit.



Double wide unit on piers with deadman anchors.



Double wide unit on piers with earth augers.

1.4 Skirting methods

Issue

Mobile homes are generally not sold already set up on a site. As a consequence, purchasers have the responsibility for all the site work required to complete the installation of the unit. The construction of proper skirting may not get the priority it should have.

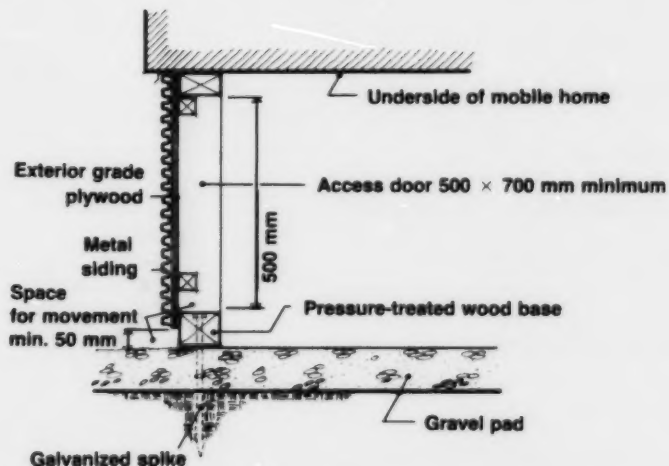
Discussion

Without a well-designed skirt, the space under the mobile home tends to be used for casual or inappropriate general storage, attracts animals and other vermin, and leaves the unprotected underside of the unit subject to damage.

Missing skirting or skirting constructed of poor quality or inappropriate materials tends to exacerbate the mobile home's reputation as temporary, low-quality housing.



A well-constructed skirt of appropriate materials is important.



The door providing access to the underside of the mobile home should be at least 500 x 700 mm.



Horizontal metal skirting with access door.

Design Solutions

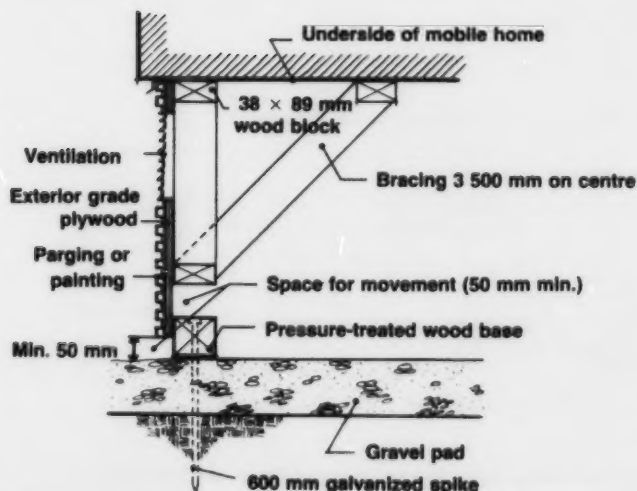
Skirting should be built with exterior-grade moisture-proof materials. Wooden materials in contact with the ground should be pressure-treated.

Wood, metal siding and concrete blocks are the materials most frequently used for skirting. The type of foundation may dictate the type of skirting which should be used.

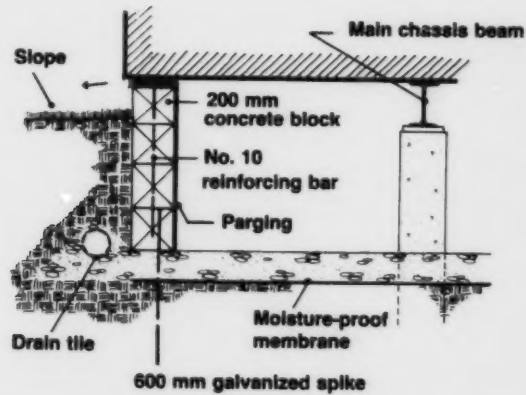
The skirted crawl space must have ventilation to control moisture. The vents should keep out snow, rain, animals and insects, have a combined total of 0.1 m^2 for every 50 m^2 of crawl space and be located on all sides of the mobile home.

Access to the crawl space is necessary for maintenance purposes. An access door with minimum dimensions of $500 \times 700 \text{ mm}$ should be provided convenient to the utility connections.

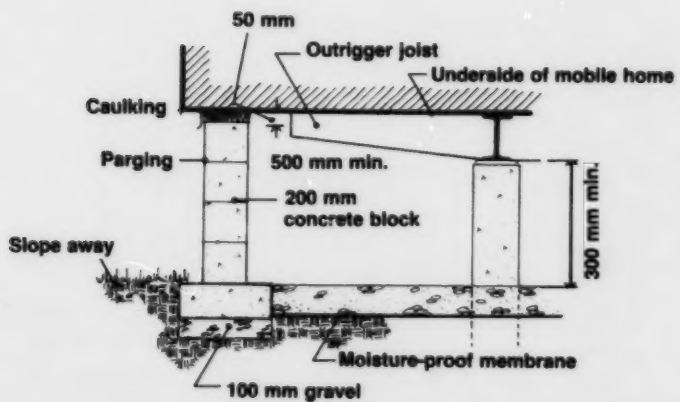
Appearances will be enhanced if the design of the skirting is coordinated with that of the mobile home itself.



The crawl space under the mobile home should be vented in at least six locations. The vents should be distributed to provide good cross-ventilation.



Reinforced concrete block retaining wall. Remember to provide sufficient ventilation of the crawl space.



Concrete block skirt on strip footing. Allow at least 50 mm between the top of the blocks and the underside of the mobile home to allow for seasonal movement.

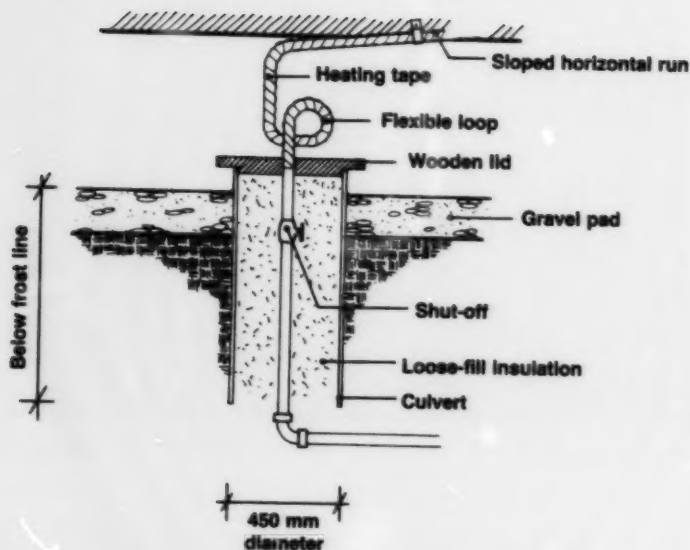
1.5 Utility connections

Issue

Improperly installed or poorly protected utility connections can cause inconvenience, expensive damage to service lines and possible health problems.

Discussion

Except where a fully insulated basement or crawl space has been built, water and sewer pipes must be adequately insulated from the underside of the mobile home to below the depth of frost penetration in order to prevent winter freeze-up.



The water supply line can rise in a small culvert that is filled with loose insulation.

Design solutions

The water supply line should be made of copper and should rise from below the frost line inside a 450 mm diameter culvert filled with loose insulation and provided with a wooden lid.

In all areas where there is risk of hard frost and freeze-up, electrical heating tape with integral thermostatic controls must be applied to all exposed water supply lines and waste-water traps.

The water supply line should have a loop of flexible copper pipe to allow for movement. The water system should be drainable, with the water supply shut-off valve located inside the insulated service riser. The service riser should be conveniently accessible from the skirt access door.

It is recommended that the sewer pipe be equipped with a trap to prevent the build-up of sewer gas under the mobile home. The trap must be located below the frost line and be provided with a separate pipe to the surface for clean-out purposes. Connections which drop down from the underside of the unit should be provided with a flexible sleeve at grade to allow for settlement.

Horizontal runs in sewer and water lines should be strapped to the underside of the chassis, and sloped for drainage.

Propane gas bottles must not be put in the crawl space. They should be kept outside, in a place accessible for pick-up and delivery, and screened from the street.

1.6 Additions and ancillary structures

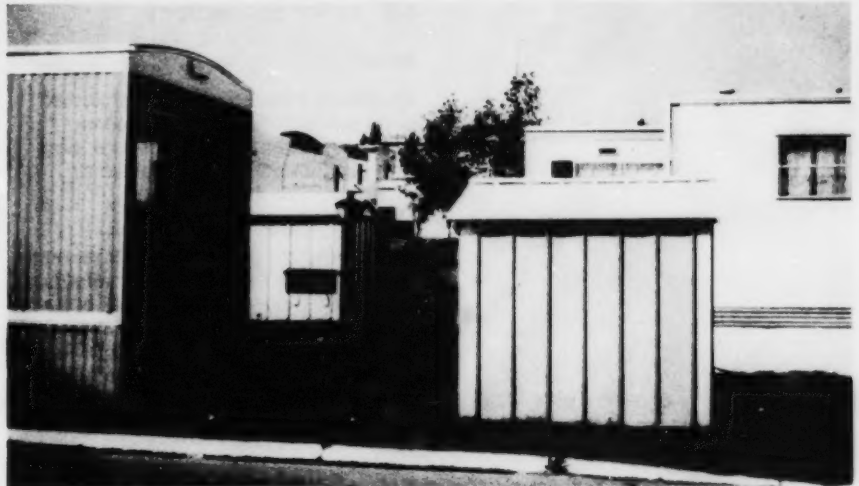
Issue

Mobile homes tend to lack storage space. Additions and ancillary structures are often built by the owners to provide this storage space but in many cases neither appropriate materials or good construction techniques are used.

Discussion

Many structures can be built to increase the living space of the mobile home or provide additional storage space. Good design can enhance the liveability of these spaces and make a positive contribution to the appearance and value of the mobile home.

Additions and ancillary structures should be located carefully on the lot, taking into account accessibility, appearance and their relation to activities which will take place out-of-doors.



Most mobile homes do not come equipped with space for the storage of seasonal or outdoor items. To remedy this problem many mobile-home owners build their own storage structures.



The small floor area of mobile homes encourages owners to build on to their unit.



When topography permits, storage space can be provided underneath an addition.

Design Solutions

Unheated storage structures should conform to CSA Z240.2 framing standard or equal. Where soil and drainage conditions on the site permit, a floor may not be necessary.

Except when specifically planned when the mobile-home unit is constructed, additions and ancillary structures should not be connected structurally to the unit. An independent foundation should be built and the connection to the unit should be made by means of spacers or a flexible joint. The heating and electrical system of the mobile home may not be sufficient to provide service to these additions. Professional advice should be obtained to determine if additional capacity is required.



Storage space can also be provided under an entrance deck.



It is not uncommon for owners to make substantial changes to their mobile home.

1.7 Orientation

Issue

An orientation that takes advantage of topographic and climatic conditions will improve the livability of the mobile home inside and the usefulness of space outside.

Discussion

Wind, sun, the view and energy conservation are important factors to be considered in orientating the mobile home on a site. The individual mobile-home occupant may have additional needs or desires. The site for the mobile home may itself offer unique opportunities, such as attractive natural features.

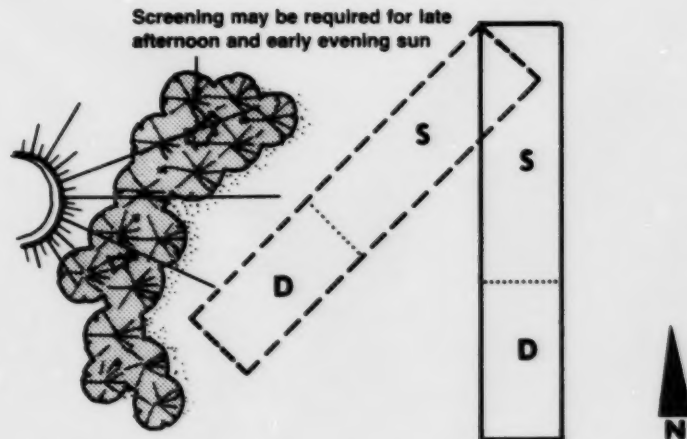
A great variety of models is at present available on the mobile-home market. It may be possible to find one that will complement the specific conditions of a particular site. On the other hand few sites will permit the perfect resolution of all problems. The need for compromise must be expected.

Design Solutions

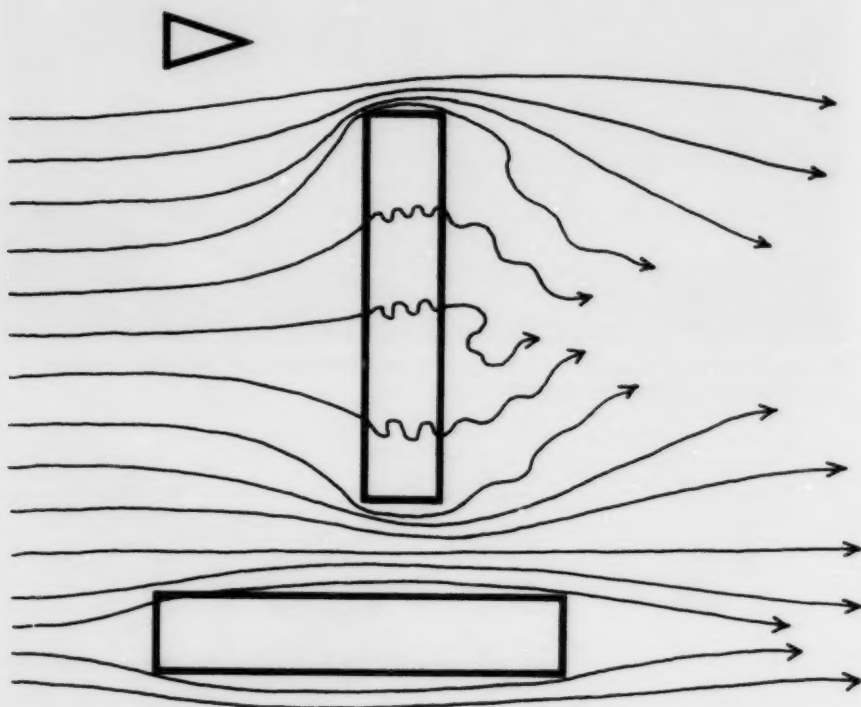
As a general rule, the mobile home should be orientated to make the most of the winter sun in the living areas of the unit and maximize year-round sun in those areas around the mobile home which are planned for outdoor living.



Orientation towards the sun is important.



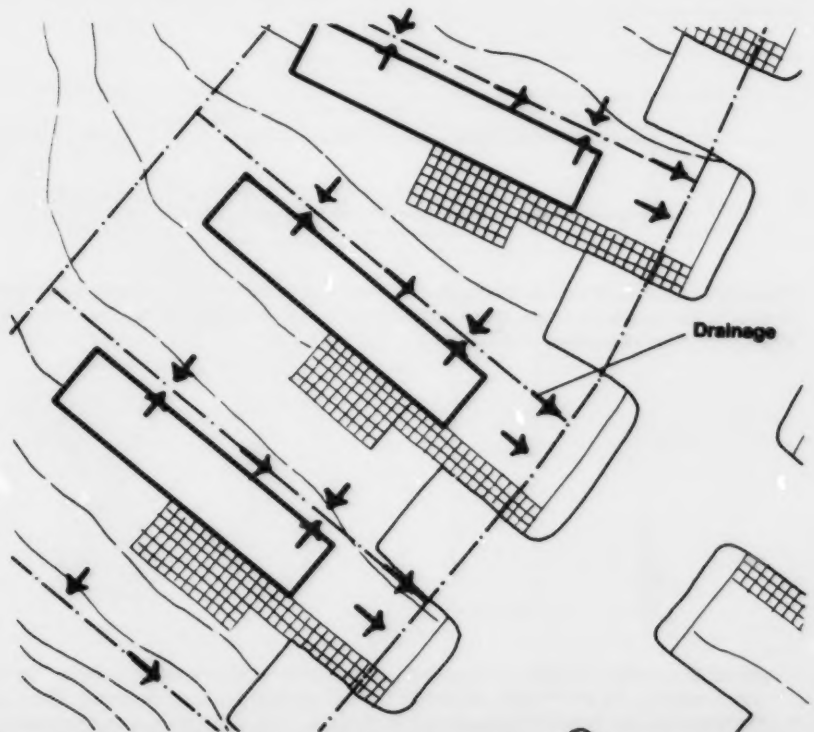
Generally, orientation to the south and west is preferable for daytime rooms and outdoor living areas. However, in many regions of the country the heat of the late afternoon and early evening sun can be a problem. A south or southeast orientation may be preferable, or appropriate screening provided.



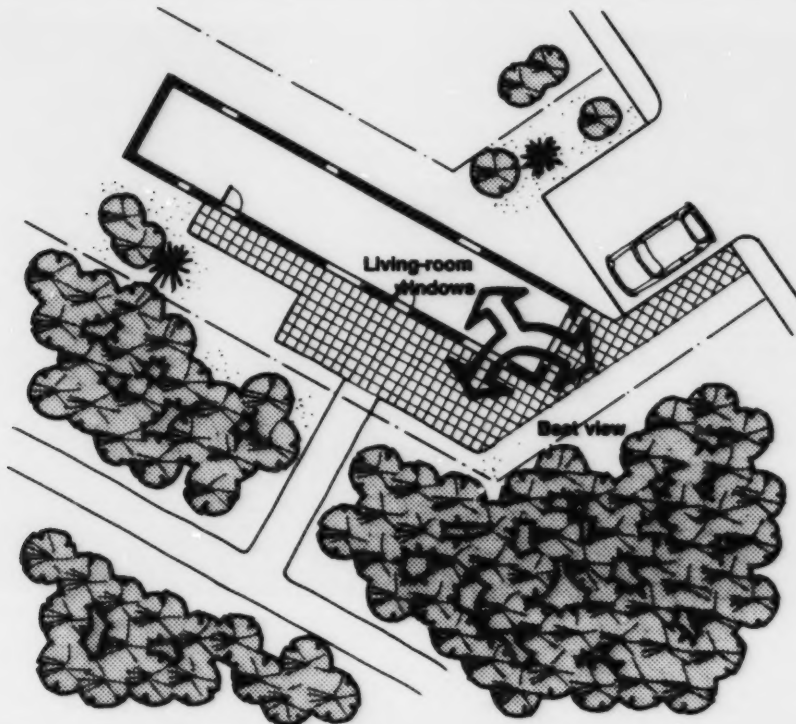
To avoid vibration and reduce the impact of wind, it is preferable that strong winds blow parallel to the long side of the single wide mobile home. A windbreak can help moderate winds and allow alternative orientations.



In order to reduce the amount of grading, it is preferable to put the long side of single wide mobile home units parallel to the slope.



Terracing mobile-home sites down a slope is usually the best approach to steep sites. However, drainage problems may be created. Because of the long-term importance of good drainage patterns to maintain the viability of the site, a grading plan must be carefully worked out.



The principal living-room window should face the best view.



Section II.

Mobile-homes on conventional lots



A mobile home in the suburbs.

Introduction

Both the quality of construction and the interior planning of mobile homes have improved considerably over the years. Mobile homes now represent good value for the prospective owner. If they are sited and installed properly, they are comparable to other forms of permanent housing.

Mobile homes and mobile-home developments are increasingly being integrated with traditional housing, using conventional subdivision planning. However, the long narrow form of mobile homes requires special attention to site planning. It is the purpose of this section to illustrate how the mobile home can be successfully sited on conventional suburban lots.

2.1 Space about the unit

Issue

The planning of conventional site-built houses should reflect the relationship of indoor and outdoor spaces, control overlook and respect the privacy of adjacent properties. Since the mobile home is prefabricated and often purchased before the lot itself is selected, the opportunity to coordinate site planning may be lost. It is important, therefore, that particular care and thought be given to the location of the mobile home on a lot.

Discussion

The siting of a mobile home on a conventional lot is constrained both by space limitations and the presence of neighbouring dwellings. In addition to the orientation considerations discussed in the previous section, the following factors should be borne in mind.

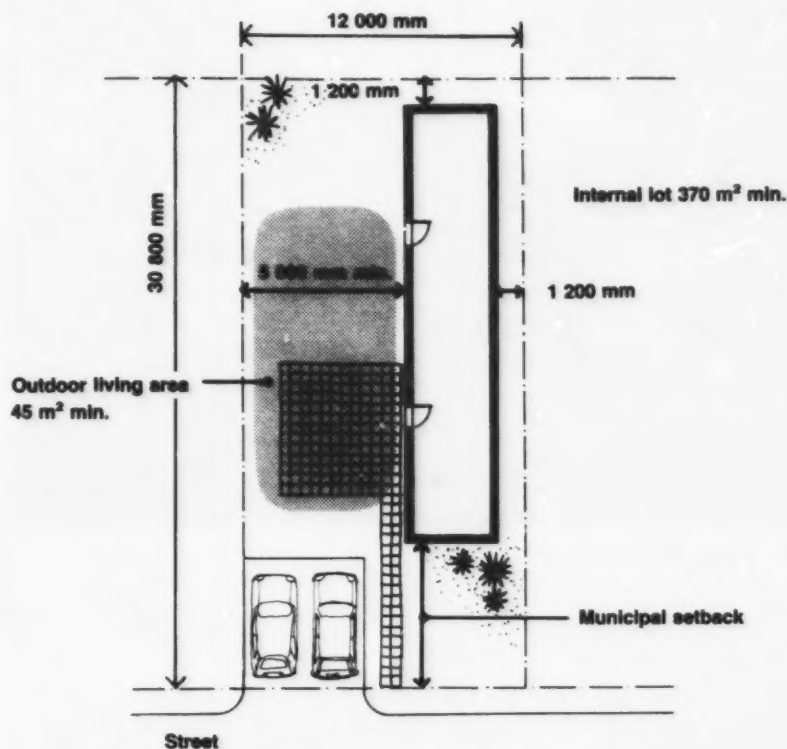
First, there must be access to the lot and space for the mobile home to be moved in and set up. However, existing trees need only be removed on the mobile-home pad location and the driveway. Tree removal should be undertaken at a later date as a part of a comprehensive landscape plan.

Second, the outdoor areas around the mobile home and their functions should be clearly defined on the lot. Possible future additions and locations for ancillary structures should be considered, as well as the need to have access on all sides for maintenance.

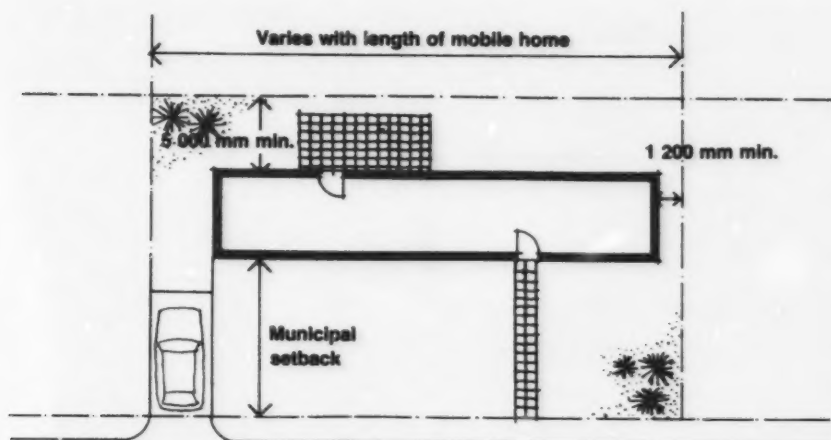
Third, the location of windows in adjacent dwellings should be noted so the mobile home will not reduce the amenity or privacy of neighbours.

Fourth, parking for at least one car should be provided on the lot.

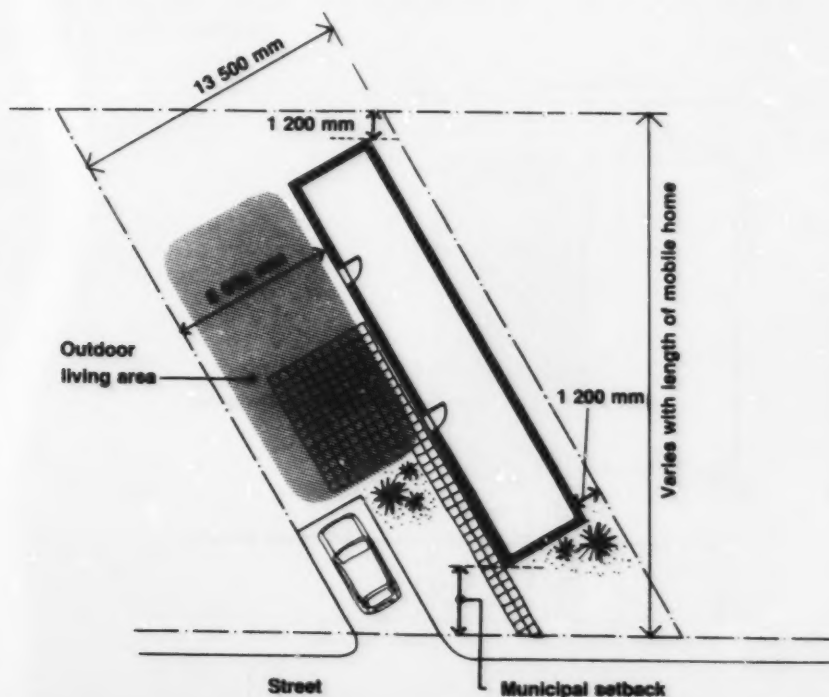
Generally, lot sizes, setbacks, and side-yard requirements are established by municipal bylaws and must be met if a permit to site a mobile home on a conventional subdivision lot can be obtained. Check the bylaws with the local municipal authorities at the earliest opportunity.



A single wide mobile home on an internal lot 12 m wide by 30.8 m deep. The lot area is 370 square metres.



A single wide mobile home with the long face parallel to the street. With a municipal street setback requirement of 7.5 m, the lot size could be 24.9 m wide by 16.8 m deep. The lot area is then 388 square metres.



Angled lots are also possible and can be recommended for the more open views provided from windows. The narrow end elevation of the single wide mobile home is also disguised.

Design solutions

The following are the recommended minimum lot sizes in conventional subdivisions.

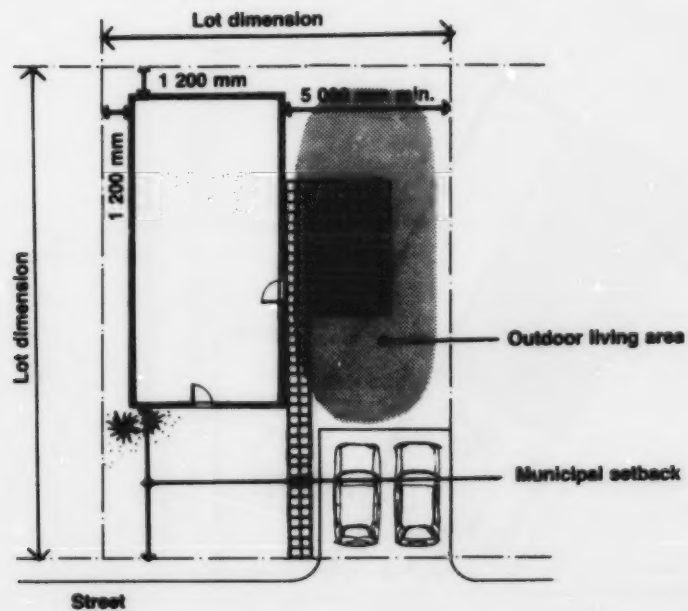
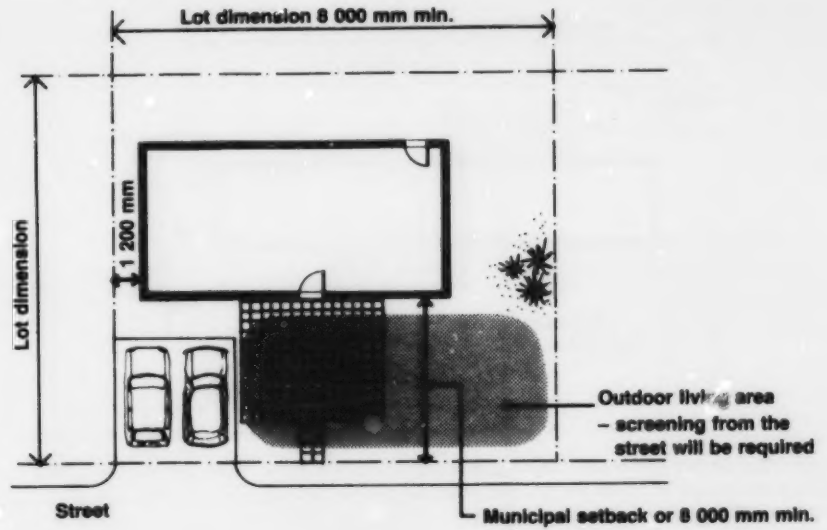
Internal lots: an area of 370 m² with a minimum width of 12 000 mm.

Corner lots: an area of 460 m² with a minimum width of 15 000 mm.

The following minimum outdoor space dimensions are also recommended:

- A side yard or easement of 1 200 mm along the face of all external walls of the mobile home and any additions which may be planned.
- A private outdoor space with minimum dimensions of 5 000 mm and a minimum area of 45 m².
- A car-parking space with a minimum width of 3 000 mm and depth of 6 000 mm. A combined walkway-driveway should be at least 4 000 mm wide. Parking areas should not be located in front of the principal living-room window.
- A main walkway with a minimum width of 750 mm from the street to the principal entrance of the unit. Secondary walkways should have a minimum width of 600 mm.
- To minimize the risk of fire spread, the space separation between units should meet the requirements of *Residential Standards*.*

**Residential Standards* 1980, NRCC 17304, (Ottawa: The Associate Committee on the National Building Code, National Research Council of Canada, 1980). See Section 10, Part N, in particular.



Double wide mobile homes are sited in the same way as conventional site-built houses.



Site landscaping can be used to emphasize the residential character of the mobile home and promote its acceptance.

2.2 Site landscaping

Issue

The long narrow shape of the single wide mobile home does not greatly resemble conventional suburban house forms. Therefore, in order to promote the acceptance of mobile homes in residential neighbourhoods, maintain the residential character of a mobile-home site and insure its long-term viability, it is important to have good landscaping.*

Discussion

Site landscaping comprises the selection of plants and natural or man-made materials and their organization on a site to meet both functional and aesthetic objectives. Good landscaping can transform the appearance of an otherwise ordinary dwelling and at the same time greatly extend the living space available to the occupants.

*See *Landscape Architectural Design and Maintenance*, NHA 5476. (Ottawa: Canada Mortgage and Housing Corporation, 1982), for a detailed discussion of this topic.

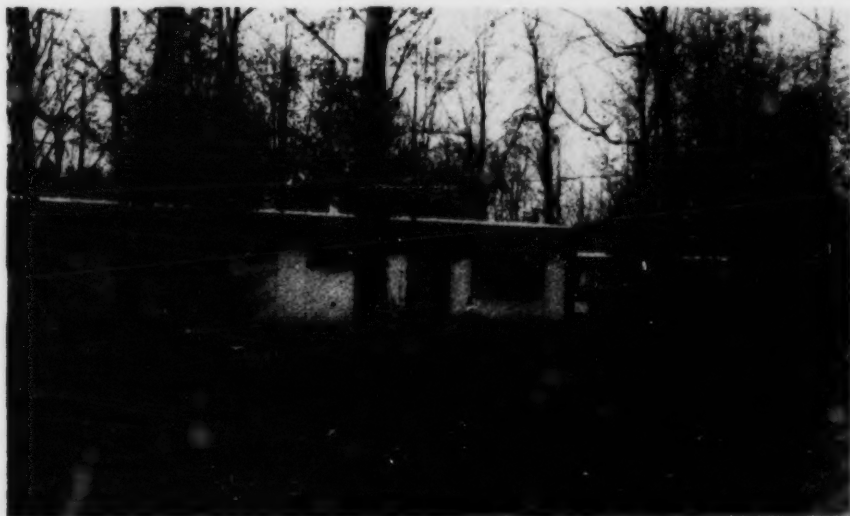
Design solutions

In general, all potential grading and drainage problems on the lot should be dealt with before the mobile home is put in place. When the basic site development has been completed, plants and man-made materials can be installed so as to develop the spaces around the mobile home and provide separation. If one thinks of landscape material as the means to create walls, roofs and ground covers, imaginative and functional outdoor spaces can be created. In addition:

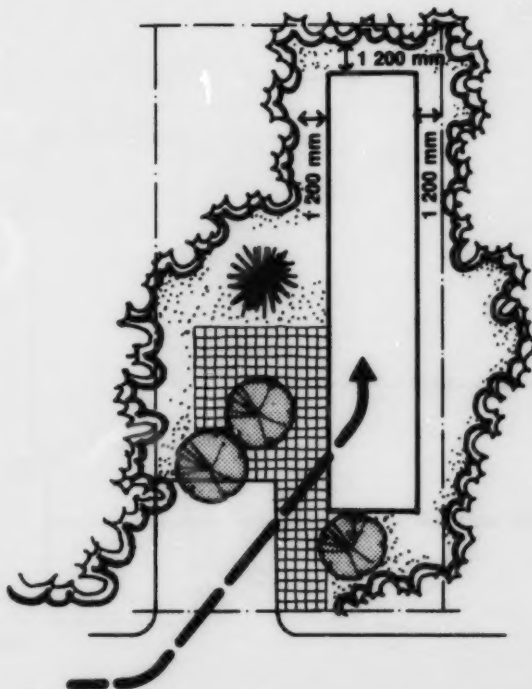
- plant materials can be used to moderate windy and hot areas and provide privacy and visual separations between neighbours*
- existing trees should be cut only where necessary to make sufficient space for the mobile-home pad, the parking area and the entrance stairs and deck. It is not necessary to cut the trees in front of the mobile home to move it in. Use the driveway and the parking space to do this
- plant materials and fences can screen propane gas bottles and garbage cans
- deciduous trees can be used to make the most of the winter sun inside and around the mobile home, while providing shade in summer.

In general, the appropriate use of good plant materials improves the appearance of the whole streetscape.

*See *Outdoor Living Areas - Advisory Document*, NHA 5329, (Ottawa: Canada Mortgage and Housing Corporation, 1980).



It is not necessary to clear the site completely in order to move the mobile home into place.



On a wooded lot, tree clearing should only be undertaken to resolve grading and drainage problems, to provide space for the parking area, and a 1 200 mm clearance around the pad.

Section III.

Comprehensively planned mobile-home projects



Low-density development usually provides good separation space between dwellings.

Introduction

The essence of comprehensive planning is interrelating the interior and exterior spaces of the dwelling and organizing groups of dwellings into cohesive, attractive communities. Conventional mobile-home unit plans are not particularly suited to comprehensive developments because these plans do not relate the location of windows and doors to space outside the unit.

However, the factory-built process by which mobile homes are constructed can be adapted to produce innovative models for use on small lots. This section discusses some of the planning considerations which are involved in comprehensively planned projects and should be used in conjunction with *Site Planning Criteria*, the publication setting out CMHC's recommended standards for site planning. * Comprehensive planning with conventional mobile-home models, as well as suggestions for innovative types, are illustrated.

3.1 Separation spaces

Issue

Space around the mobile home is required to provide separation from adjacent activities, other dwellings, and to provide outdoor areas for the use and enjoyment of the occupants.

*See also *Residential Site Development: Advisory Document*, NHA 5364, (Ottawa: Canada Mortgage and Housing Corporation, 1981).

Discussion

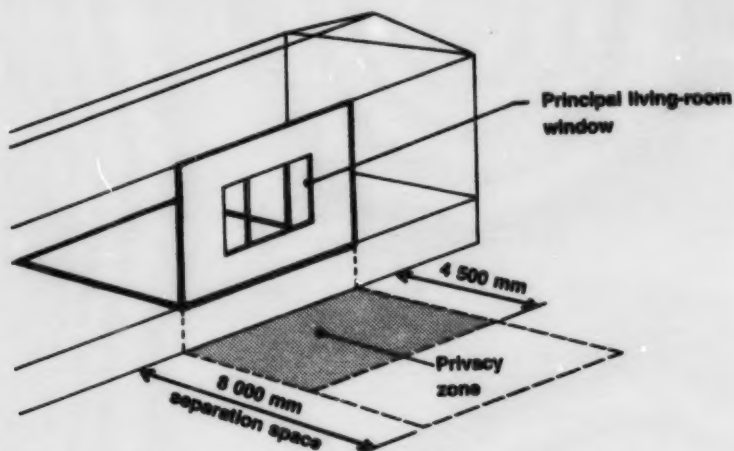
Separation space is needed to:

- provide daylight and sunlight in the habitable rooms
- provide natural ventilation
- allow for rest and privacy within the unit without interference from external noise
- permit residents to make full use of their interior living spaces without having to keep curtains, drapes or blinds closed
- provide an open view from at least one of the principal living-room windows.

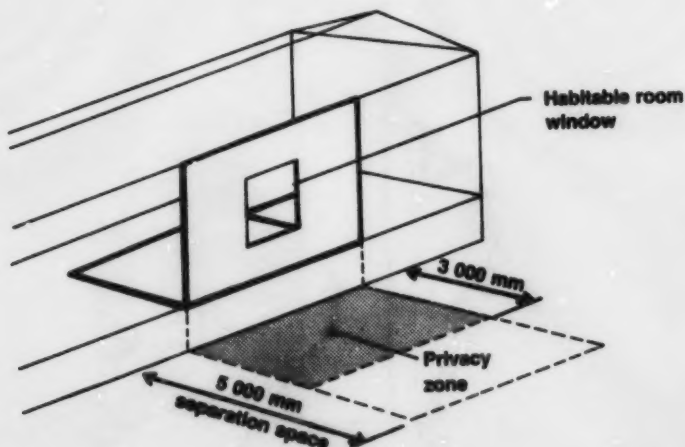
Design solutions

The following separation spaces around the mobile home are recommended:

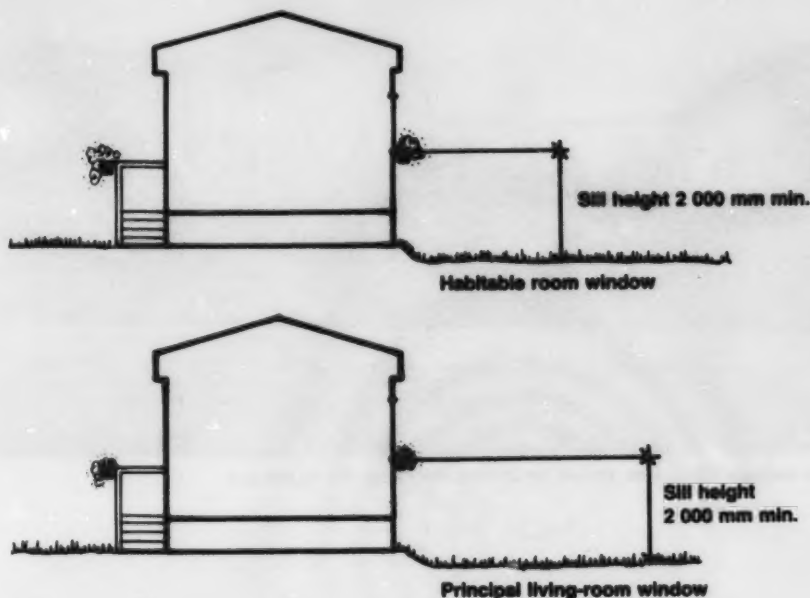
1. In front of the principal living-room window – 8 000 mm. At least one window, and in particular the largest or most important window in the main living area of the mobile home, should have an open aspect which allows adequate daylight and sunlight to penetrate into the unit, and allows good views to the outside. Part of this separation space can overlap quiet public or community areas as long as a 4 500 mm deep privacy area is maintained in front of the window.



Recommended separation space in front of the principal living-room window.



Recommended separation space in front of habitable room windows.



When the sill of the window is at least 2 000 mm above grade a separation space for privacy from passers-by may not be necessary.

2. In front of habitable room windows – 5 000 mm. Other habitable room windows in the mobile home – kitchens, dining rooms, family rooms and bedrooms – need a separation space in front of them. Part of this space can overlap quiet public or community areas as long as a 3 000 mm deep privacy area is protected in front of the window.

3. In front of nonhabitable room windows and blank walls – 1 200 mm. In front of other nonhabitable room windows (such as bathrooms, corridors and storage rooms), entrances and blank walls, a separation space is needed for ventilation, access and maintenance purposes.

The separation space should be free of buildings, roadways, communal parking areas and any communal amenity areas intended for active use.

The recommendations for separation spaces are additive.

Because of the technology used in their construction, mobile homes are at a greater risk from fire than most conventional site-built house forms. The minimum requirements for fire separation set out in *Residential Standards** must be met in all cases.

**Residential Standards* 1980, NRCC No. 17304, (Ottawa: The Associate Committee on the National Building Code, National Research Council of Canada, 1980). See Section 10, Part N, in particular.

3.2 Amenity areas

Issue

Space outside the unit is required for the passive enjoyment and active recreational needs of the residents. However, the cost of developing land tends to put pressure on the provision of this amenity. At the same time it is not always clear what types of amenity area are most appropriate.

Discussion

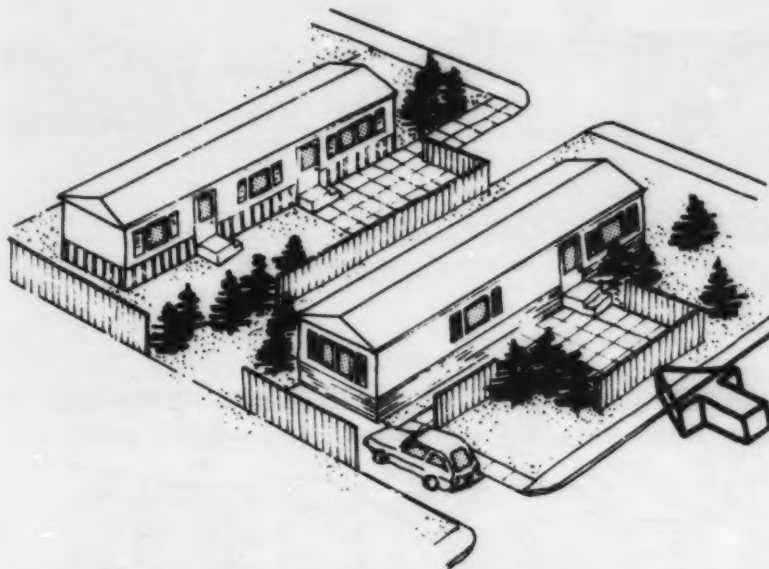
Two types of amenity area should be provided:

- 1) An outdoor living area adjacent to the mobile home to permit an extension of the indoor activities to the outdoors. This amenity area should offer private space for a variety of outdoor recreational and leisure activities, such as eating outdoors, children's play, gardening and sunbathing.
- 2) Outdoor space and facilities for the communal activities of the residents. This community amenity area can be planned for active games and sports, or more passive uses such as sitting outdoors. Indoor facilities for both active and passive communal recreation are included.

Because mobile-home developments are limited to relatively low densities, it is usually easy to provide a great deal of private outdoor space simply by meeting the recommended separation spaces. Consequently, the need for a community amenity area may not be given sufficient emphasis. These areas are an important means of giving mobile homes an attractive high-quality image and community identity.



The outdoor living area should be immediately adjacent to the unit.



The outdoor living area should be screened from public areas.

Design Solutions

All amenity areas should be located to get as much sunlight as possible. In addition, they should be large enough to accommodate the activities for which they have been planned, and be accessible from all the units. Amenity area does not include space occupied by residential and nonrecreational-use buildings, parking areas and driveways.

The recommended minimum amount of amenity area is usually based on population size, with the number of bedrooms used as a convenient indicator. The recommended amount is as follows:

- one-bedroom unit: 20 m²
- two-bedroom unit: 55 m²
- three-bedroom unit: 90 m²
- four-bedroom unit: 100 m²

Where the models and sizes of the mobile-home units are not known, the basis for the total amenity area calculation should be 90 m² per unit, since most mobile homes have three bedrooms.

Outdoor living area *

As a part of the total amenity area, a landscaped outdoor living area of at least 45 m² should be provided adjacent to the mobile home. It should be one uninterrupted space, not made up of leftover side yards, strips of front yards, and so on.

The outdoor living area should be screened so that people cannot see into a part of the space from adjacent areas at a normal standing eye level. Access from the street should be provided to the area.

*See *Outdoor Living Areas: Advisory Document*, NHA 5329, (Ottawa: Canada Mortgage and Housing Corporation, 1980).

Community amenity area

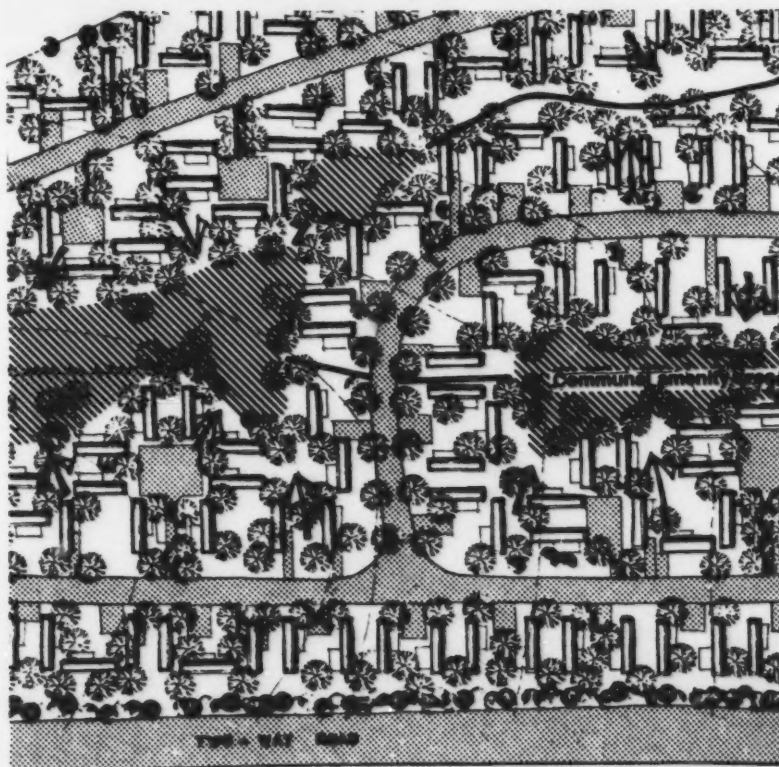
Community amenity areas can be developed for either active or passive uses. The active uses provided will reflect the needs and expectations of the occupants. Young families need more active areas than the retired person. The passive uses may involve the provision of general site landscaping, outdoor sitting areas and the attractive development of pedestrian routes linking the active community areas and facilities.

In family-housing projects, there should be a space devoted to children's play.* In general, play spaces should be centrally located, easily accessible, and safe. The needs of both preschool and school-age children should be kept in mind when designing these play spaces.

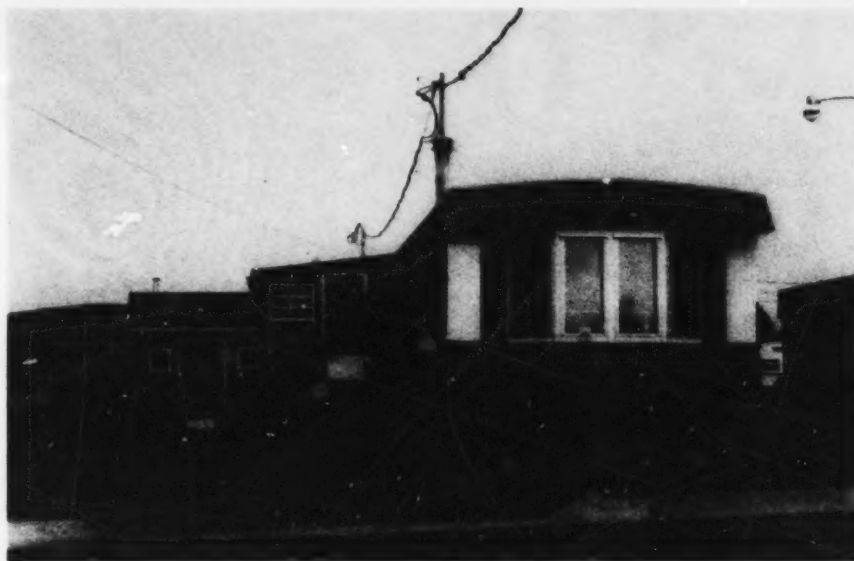
*See *Play Spaces for Preschoolers: Advisory Document*, NHA 5138M and *Play Opportunities for School-Age Children, 6 to 14 Years of Age: Advisory Document*, NHA 5318. (Ottawa: Canada Mortgage and Housing Corporation).



Community amenity areas and facilities should be carefully chosen to reflect the needs and expectations of the residents.



Community areas can be linked with landscaped pedestrian routes.



The car-parking space should not be located in front of the principal living-room window.

3.3 Parking

Issue

Mobile-home developments are rarely in central urban areas where there is good public transit. As a consequence, car ownership is high. The number of recreation vehicles owned also tends to be high.

It is important that parking spaces be provided in sufficient quantity, in appropriate locations and laid out in an attractive manner.

Discussion

Whether a parking space is provided on the lot at the dwelling, depends on many factors and affects both security and convenience. In comprehensively planned projects for mobile homes, grouped parking areas may be an advantageous solution.

Generally a parking space can be provided at the unit for densities below 35 units/hectare. It is unlikely that greater densities are possible with mobile homes. The argument can be made that cost and land-use savings can be achieved with grouped parking schemes even at lower densities.

Design solutions*

Local municipal bylaws usually determine the minimum number of parking spaces which must be provided.

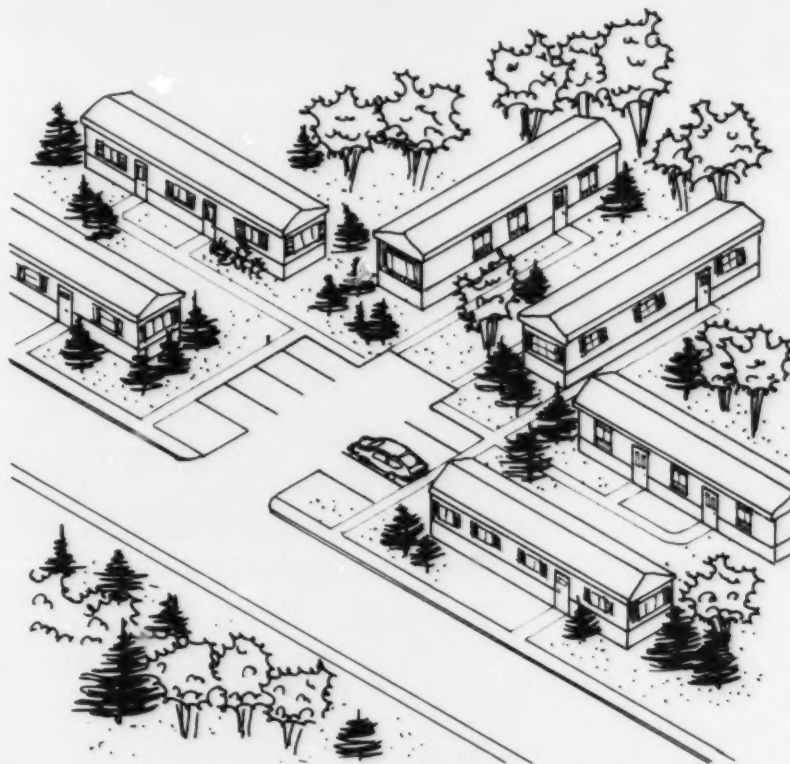
In conventional lot layouts where mobile homes are sited on streets, individual parking at the unit is preferable so long as the lots are of sufficient size. The parking space should not be in front of the principal living-room window or take space away from the outdoor living area.

Visitor parking spaces should be provided at the rate of one space for every six mobile-home lots. Most of the spaces should be located near the community facilities.

Parking for recreation vehicles should be provided in a screened area elsewhere on the site at the rate of one space for every six mobile-home lots.

Grouped parking areas should be within 45 m of the mobile homes they serve and be no larger than 20 spaces.

The minimum standards for construction of parking areas and driveways should conform to *Residential Standards*.** In general, one may expect long-term savings to accrue from high standards of construction.



Small grouped parking areas can be provided convenient to each mobile home.

*See *Parking Areas: Advisory Document*, NHA 5239. (Ottawa: Canada Mortgage and Housing Corporation, 1980) for general and detailed advice.

***Residential Standards 1980*, NRCC No. 17304. (Ottawa: The Associate Committee on the National Building Code, National Research Council of Canada, 1980). See Section 39 in particular.



When repeating the same mobile-home model, care must be taken to introduce variety in other site elements.

3.4 Co-ordinated site elements and design details

Issue

By the very nature of the separation between mobile-home production, purchase and project development as well as the rapid evolution of model types, mobile-home parks can have a mixed, rather unattractive appearance. However, the repetition of the same model of mobile home throughout a development will not provide the most attractive environment either. A balance between uniformity and excessive variety is important.

Discussion

Mobile-home developments tend to be very heterogeneous unless efforts are taken to provide a common theme or motif. A uniform character to the development can help to provide community identity. However, rigid limitations on model types, landscaping and use of the spaces around the mobile home can deny occupants the opportunity to give their homes a personal identity.

Design solutions

The following elements are amenable to common treatment. Their suitability will depend on the type of development being considered and the tenure of the mobile-home units on the site.

1. Stairs, steps, balconies and decks.

The consistent appearance of these major elements can give harmony to a development. It is not the design of these elements that is important, but the common materials used to build them.

2. Storage sheds and garbage storage cupboards.

A standard form of construction, size, or materials can be used for these ancillary structures.

3. Add-on elements.

The construction and appearance of carports, pergolas, and so on, can be co-ordinated. It might be appropriate to use the same detail within each cluster of mobile homes while changing colours or materials from cluster to cluster.

4. Fences and landscaping.

These elements are easy to regulate and may be the easiest way of obtaining an overall co-ordinated appearance.

5. Colour and materials.

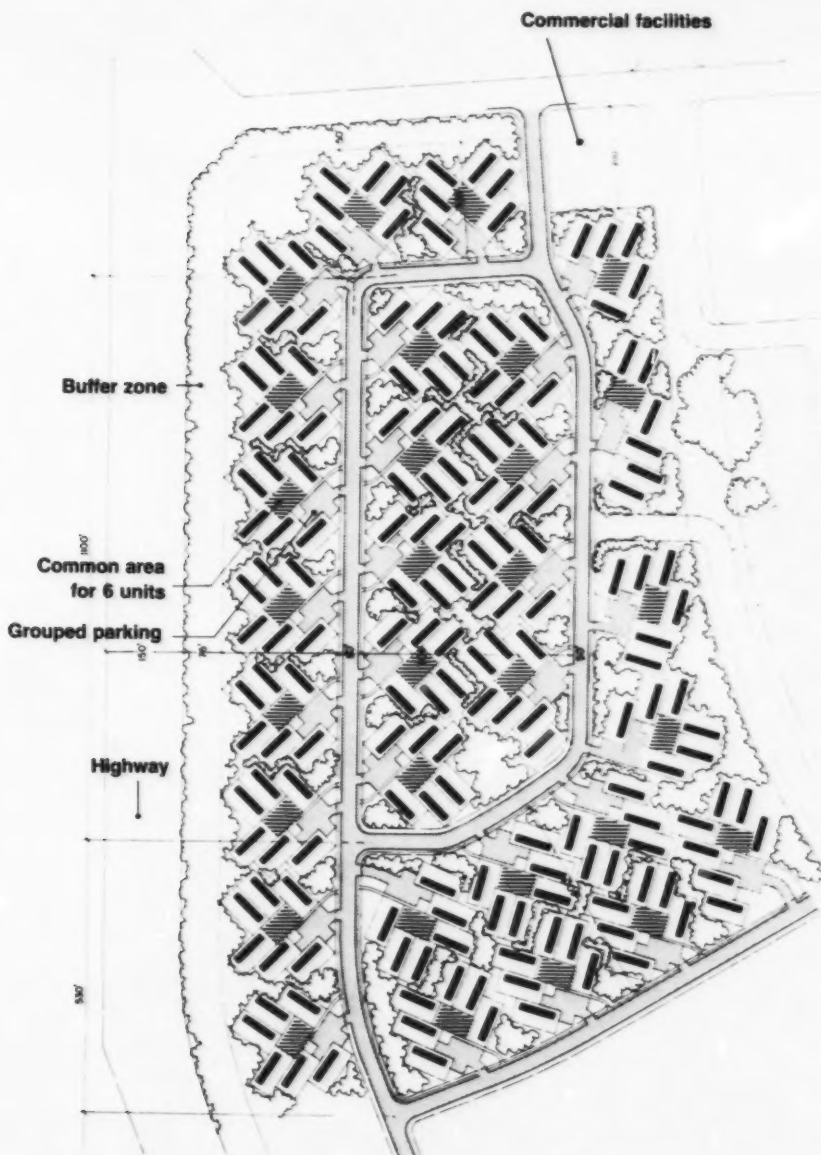
The colour and construction materials of all elements can also be co-ordinated. Residents can be given a choice of colours from a common palette that has been preselected for tone and hue.



Plant materials can be used to provide a common theme.



Common materials and design details give an attractive character to the individual mobile-home site.



A comprehensively planned mobile-home development with grouped parking and common amenity areas at each cluster.

3.5 Comprehensive planning with conventional mobile-home models

Issue

Typical mobile-home plans now in production tend not to lend themselves to comprehensive planning because room windows appear on all four sides of most models. The recommended separation spaces which result, produce lot sizes in excess of those for conventional suburban development.

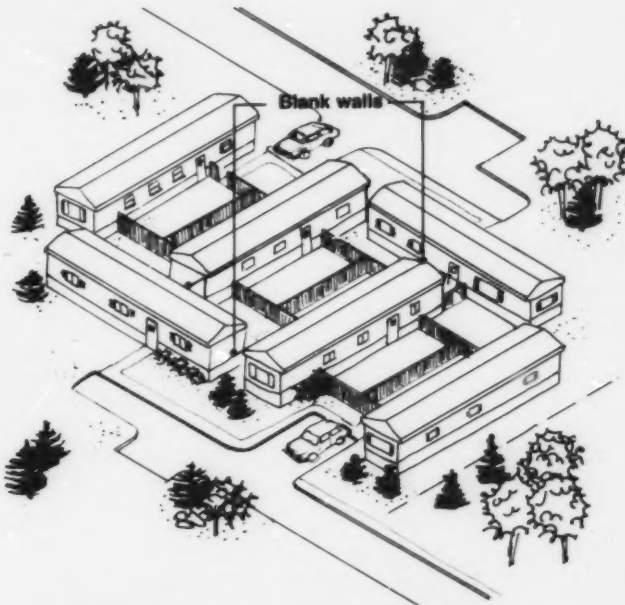
Discussion

Preselection of models is critical to the comprehensive planning of a mobile-home development with conventional units. The selection should take into account the location of doors, habitable room windows, and the principal living-room window. Models with at least one blank wall offer the greatest potential for site development. With careful consideration as to which

mobile-home model will go in each location, an attractive mobile-home development can be achieved at densities higher than conventional lot planning.

Design solutions

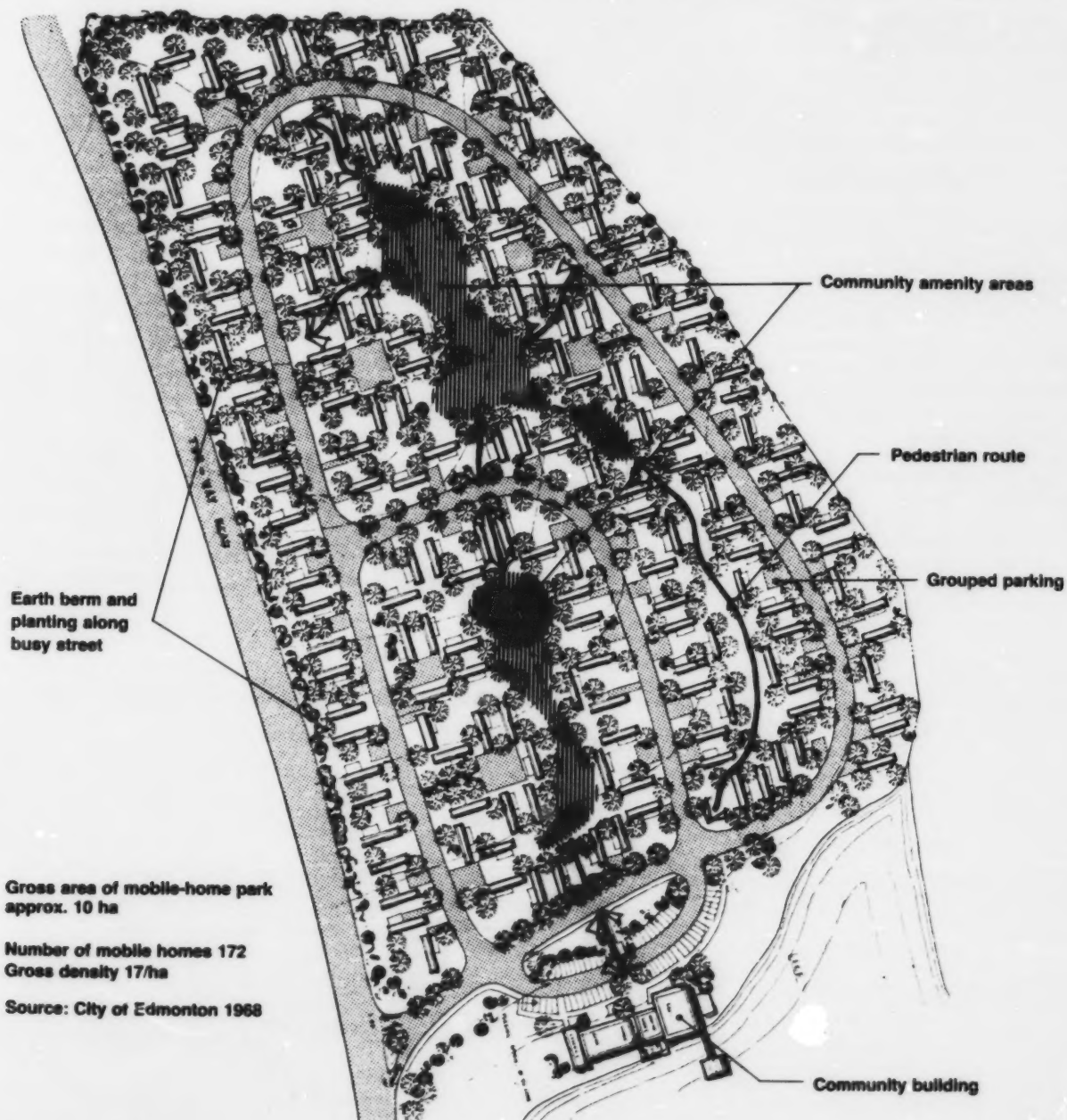
The following illustrations show possible arrangements using conventional mobile-home units, with the recommended separation spaces. All of these arrangements are of the cluster type, which gives reasonable densities as well as diversity.



A cluster arrangement will free more space for landscaped open areas.



Pedestrian routes should lead from cluster to cluster and join amenity areas.

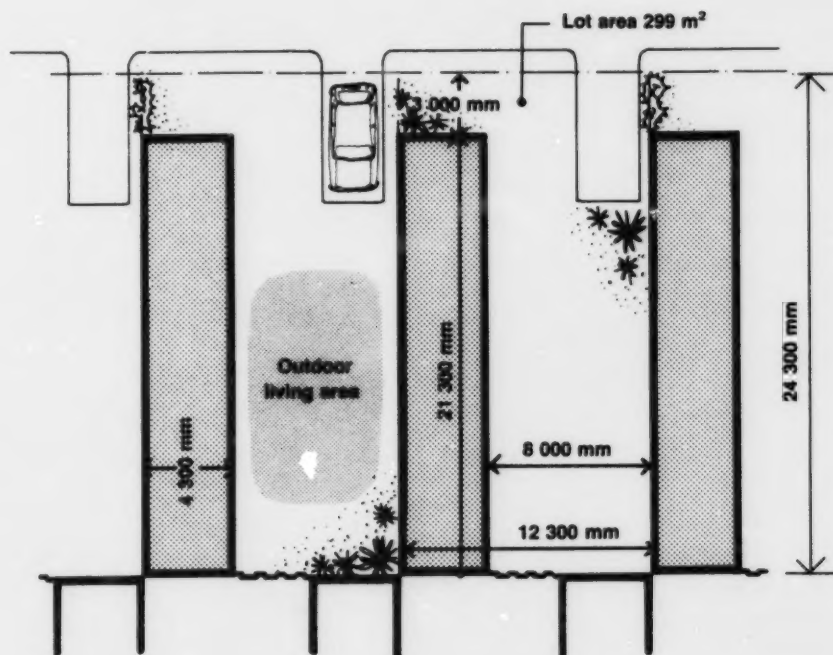


A comprehensively planned mobile-home development.

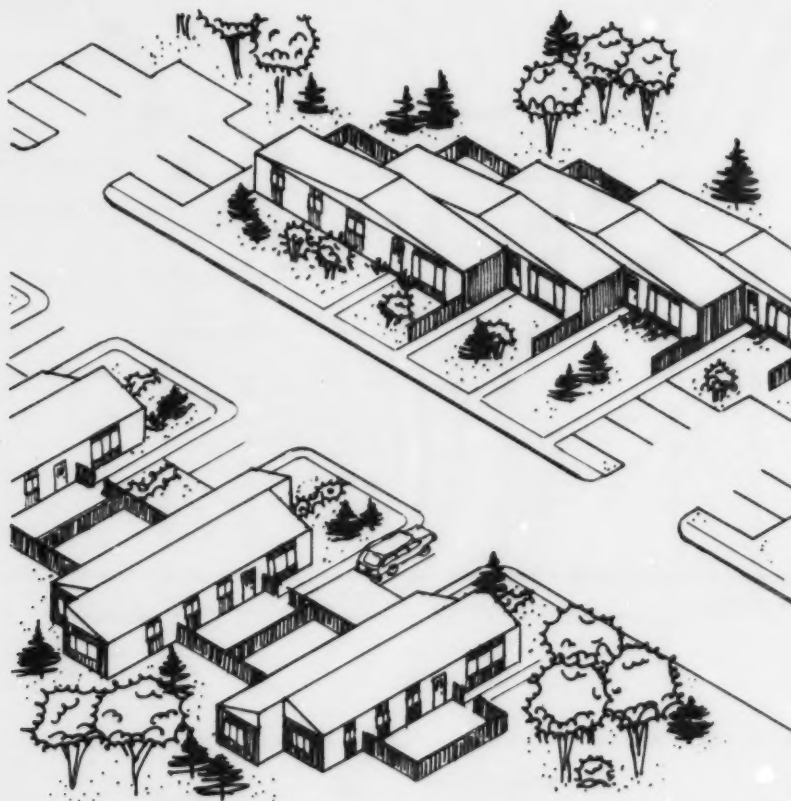
Issue

Discussion

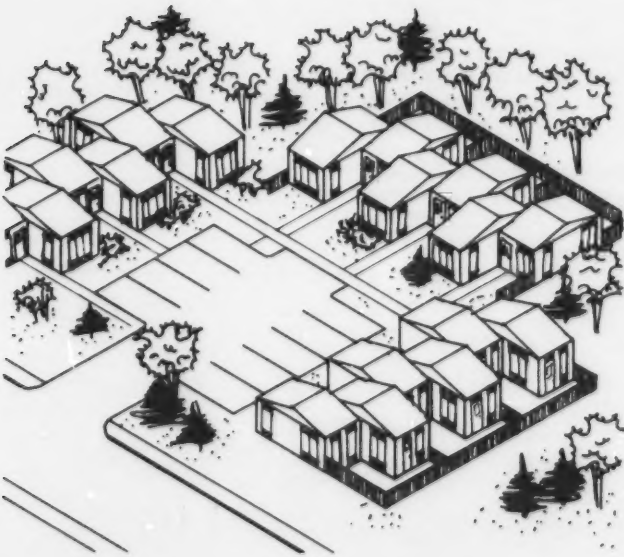
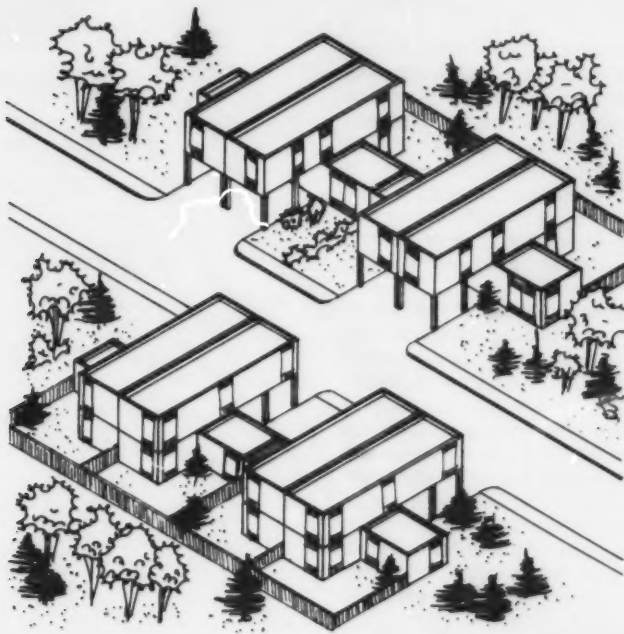
To attain higher densities while maintaining good quality residential environments, there must be comprehensive co-ordination of the interior spaces of the mobile home with the spaces around it. Through co-ordination, lot sizes can be reduced without loss of utility or amenity. Two means can be used to achieve these higher densities. First, through the production of mobile-home models which



With two blank walls it is possible to reduce the lot size to less than 300 square metres.



Semi-detached, row or stacked units are a possibility but the technology to provide adequate fire separation still needs to be developed.





Section IV.

Rehabilitating existing mobile-home parks

Introduction

Until recently, most mobile-home parks were developed without the application or benefit of planning controls or guidelines. In addition, the regulation of mobile-home production was not strictly enforced and models in the early years were often small, constructed with poor or inappropriate materials and did not provide as good housing or investment value as they might have.

Today, mobile-home developments can offer all the features of good planning, attractive appearance and sound construction found in conventional site-built housing. However, there still remain a large number of older developments which do not meet these standards. Because mobile homes can be removed and relocated with ease compared to conventional houses, the rehabilitation and upgrading of mobile-home parks may be a relatively straightforward undertaking.

Some of the major problems encountered in older parks are:

- old substandard models on narrow lots with inadequate separation spaces
- road layouts which do not make the best use of the site or which are poorly engineered and not related to traffic volume
- utilities that do not meet present standards for health, safety and good practice

- inadequate or nonexistent community amenity areas
- a lack of effective park management
- units that have not been installed properly on good foundations and have not been securely anchored
- additions which have been built of poor materials that have deteriorated over the course of time.

Extensive replanning and re-engineering work may be required to deal with some of these problems — others are amenable to simple, inexpensive changes. Engineering problems are of the greatest concern because of their impact on health and safety. Rehabilitation work to improve foundations, anchoring, and to bring utilities up to present standards should be encouraged.

Each mobile-home park presents an individual case and its specific problems require specific solutions. The solutions described in this advisory document will have to be adapted to suit the needs of each situation. In every case a long-range rehabilitation plan should be established.

4.1 Reorganizing the road network

Issue

Old parks were often developed on an ad hoc basis without the aid of an overall plan. As a consequence the road network may be wasteful of land and traffic patterns may be poor.

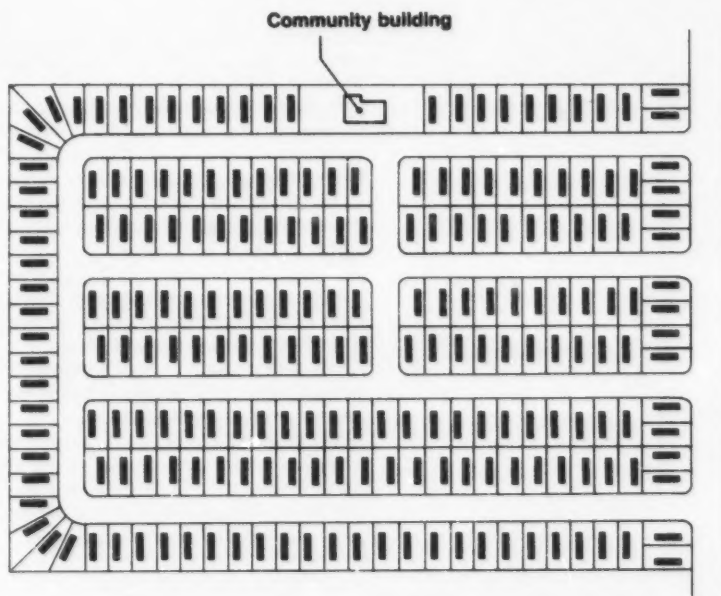
Discussion

In general, the proportion of the site area devoted to streets should be reduced to a minimum and the movement of traffic should be based on traffic volumes.

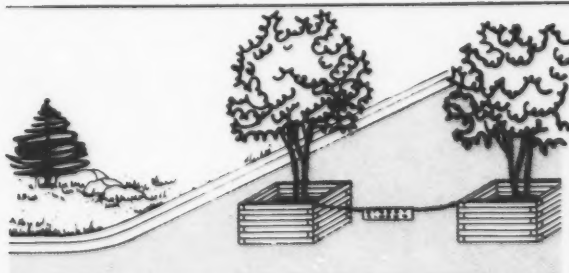
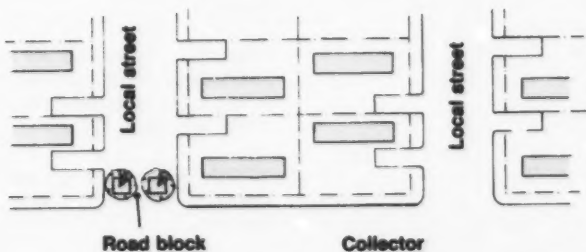
The road network should be organized so that there is ready access to community facilities. This is often best provided by having the main access to the site adjacent to community buildings. Pedestrian circulation routes should be included in the replanning of the road network.

Design solutions

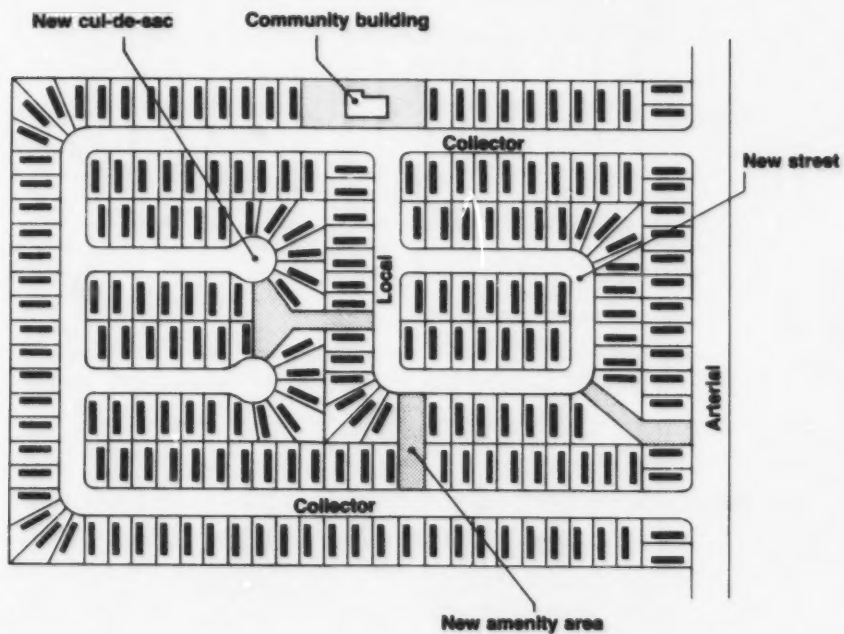
A variety of solutions are possible, but the main principle that should be followed is the establishment of a hierarchical road network whereby through routes are minimized and local streets lead into a collector.



The orthogonal road pattern is wasteful and does not differentiate streets by the amount of traffic they carry.



Traffic volumes and speeds can be reduced by blocking through-streets with planter boxes, removable fences or posts.



By creating local streets, parts of the site can be used for other purposes, traffic is minimized and pedestrian circulation can be made safer.

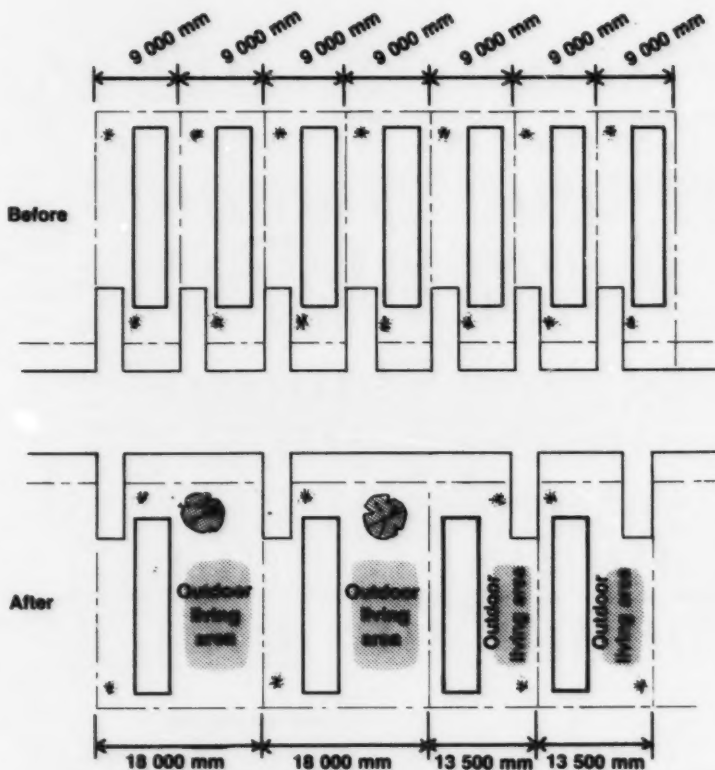
4.2 Rearranging the lots

Issue

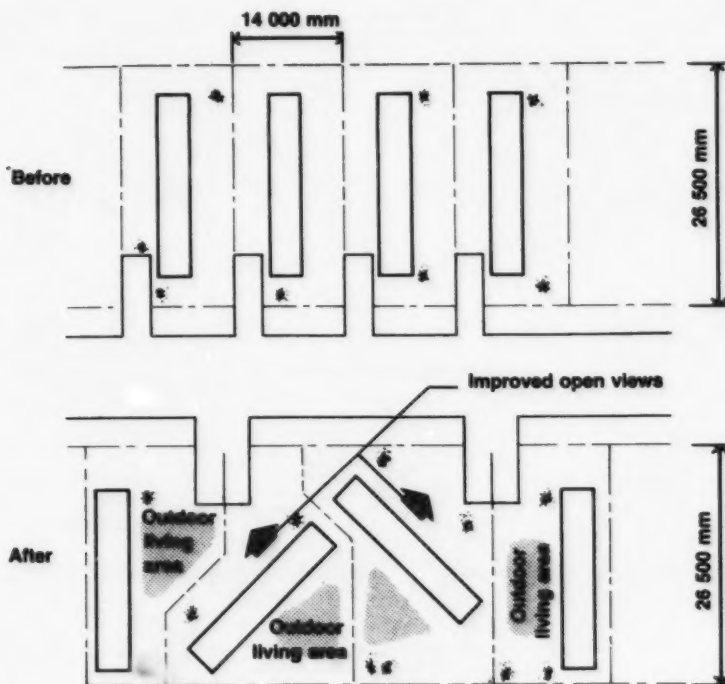
In many older mobile-home parks, lots are too narrow to allow for adequate outdoor living areas or give sufficient separation space between units. In addition, they are often too short to allow the installation of current 20 115 mm long models.

Discussion

In general, some of the mobile-home lots can be increased in size by reducing their overall number. This can be accomplished through a policy of reserving vacated lots until there are sufficient number to allow replanning or through a phased plan where some of the mobile homes are bought out or relocated, and the whole park redeveloped on an incremental basis. On a small scale, the area left by removing one or two units can be shared by those remaining.



Improved open space can be achieved by removing every second or third lot and reallocating space to the remaining mobile homes.



Different lot configurations provide a varied streetscape as well as more openness.

Design Solutions

There are two basic approaches to improving separation spaces and providing more useable space around the mobile home. These are:

a) Reducing density

Narrow lots can be combined two-by-two to offer spacious new lots. Three lots can make two, or four lots can make three, and so on. These solutions offer reasonably sized outdoor living spaces.

b) Changing lot shape

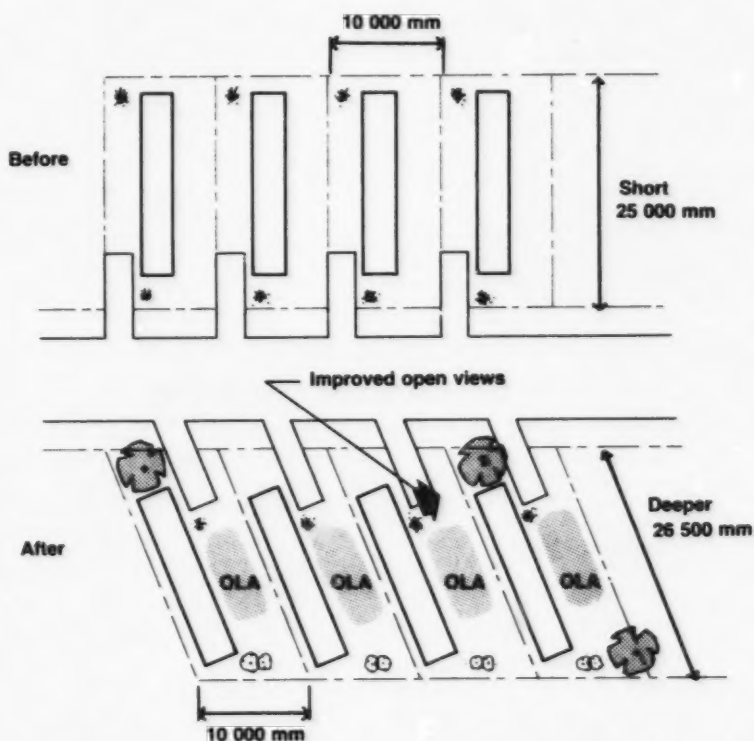
A change in the angle in which the lots are laid out can increase lot depth so that longer units can be installed, or better orientation to sunlight and views can be provided.

Irregularly shaped lots offer the opportunity to vary the position of the mobile home so as to give wider views to the occupants, provide greater privacy for outdoor living areas, improve orientation to the sun and create diversity.

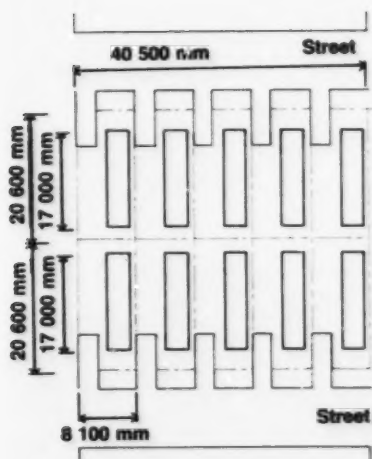
A combination of density reduction and a change in lot shape may be helpful in resolving more complicated problems. In some cases it might be possible to cluster several units together. Clusters help to give identity to subgroups within the mobile-home park. This identity can be enhanced by giving each cluster a different appearance through the use of varied planting and landscape materials.

Repositioning mobile homes and the wholesale replanning of lots require that new services be installed and new foundations be constructed. This can be costly and may not be sensible unless there is a real need to upgrade both of these elements.

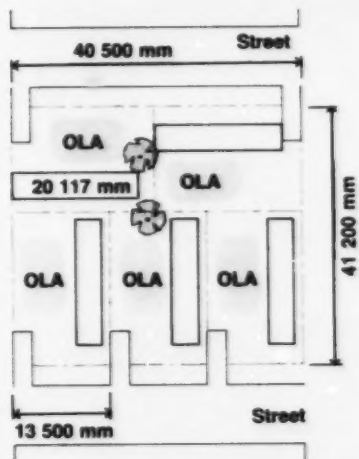
Probably the least expensive, but often the most effective approach, is to follow a long-term policy of allocating space on vacated lots to adjacent mobile homes and perhaps undertaking to relocate the occasional mobile home where and when this may be necessary.



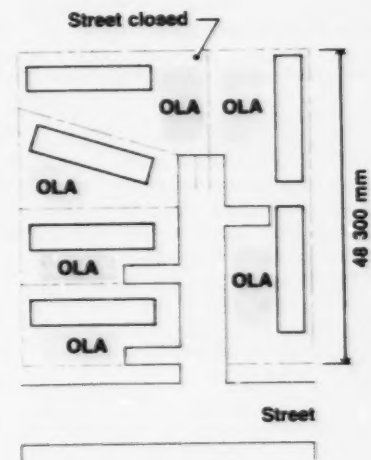
Angled lots give increased lot depth as well as an improved aspect for the principal living-room window.



Original layout with small mobile homes.



Larger mobile homes on larger lots.



Cluster arrangements allow every second street to be closed and the space used to increase lot sizes.

4.3 Relocating car-parking areas

Issue

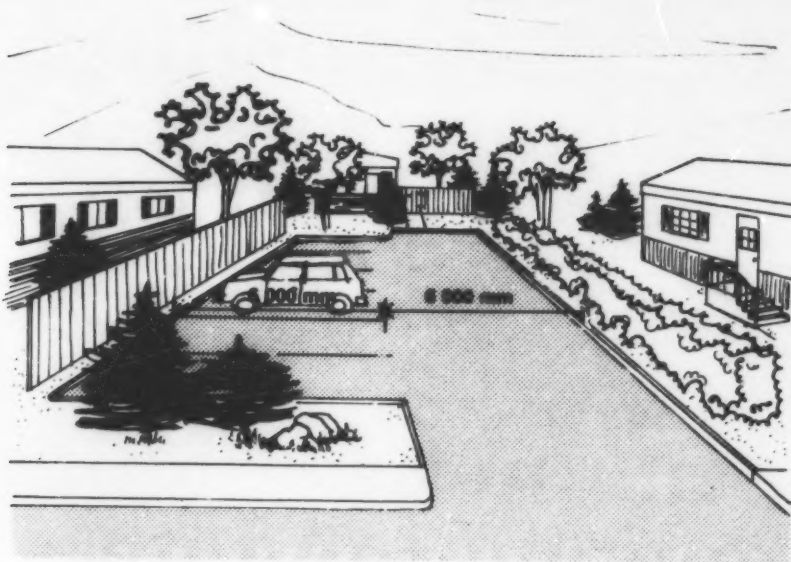
Car-parking areas on small lots take space away from the outdoor living area and lower the effectiveness of separation space between mobile homes.

Discussion

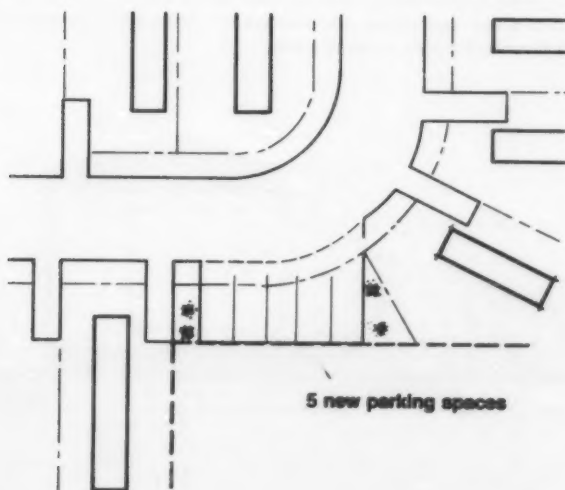
An outdoor living area should be given priority over a car-parking space on the lot even when this requires moving the car-parking space to a grouped parking area. Small grouped parking areas immediately adjacent to the lots are the best approach. Car-parking spaces, whether on the lot or in a grouped parking area, should not be situated directly in front of the principal living-room windows.



In older parks with small lots, parking on the lot uses up valuable outdoor space and may create a nuisance for adjacent mobile-home owners.



A vacant lot can be used to create a grouped parking area.



Small or irregular pieces of land may be replanned as parking spaces.

Design solutions

Finding locations for grouped parking areas that are convenient to the mobile homes they are to serve can be difficult in older mobile-home parks with very small lots. However, the development of a parking area for recreation vehicles and second cars in a remote part of the site will ease demand for space. It may be necessary to convert a vacated mobile-home lot into a parking area in order to provide the required number of spaces.

4.4 Improving community amenity areas

Issue

One of the attractive features of mobile-home parks is the strong sense of community identity which often develops. Community facilities and outdoor recreation areas can make a valuable contribution to this sense of identity, yet older parks frequently lack these amenities. Older mobile-home developments may not provide needed play areas for school-age children or common areas where adults can socialize.

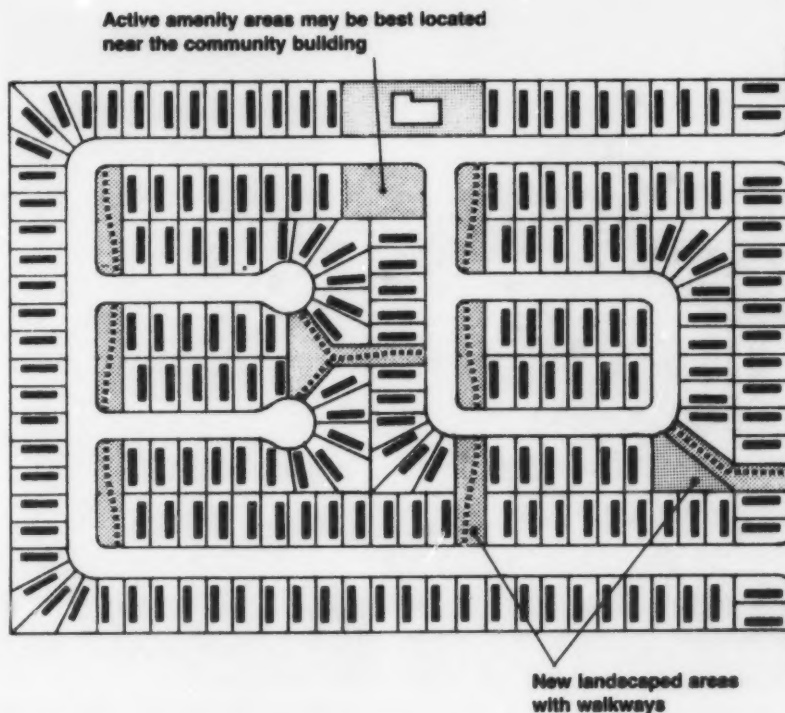
Discussion

In general, community amenity areas appropriate to the type of occupancy of the mobile-home park should be provided. They should be centrally located and form part of a pedestrian walkway system giving access to all parts of the mobile-home development.

Design solutions

Careful consideration should be given to the type of new amenity area to be provided in an existing mobile-home community. Older developments may no longer have many children as residents, therefore elaborate play areas would be inappropriate. Active adult recreation amenities may best be selected by consulting members of the community.

One of the simplest yet most effective ways of increasing the amenity of a community is to develop small parks with attractive seating and planting. These should be located so as to provide a focus for a large group of mobile homes or to form part of a natural route between community buildings and surrounding areas of the park.



When replanning an older mobile-home park the community amenity areas can be developed as a part of a new pedestrian walkway system. Vacant lots or irregular areas may be suitable for development as amenity areas.



In older mobile-home parks privacy between facing windows may be inadequate.

4.5 Improving privacy between units

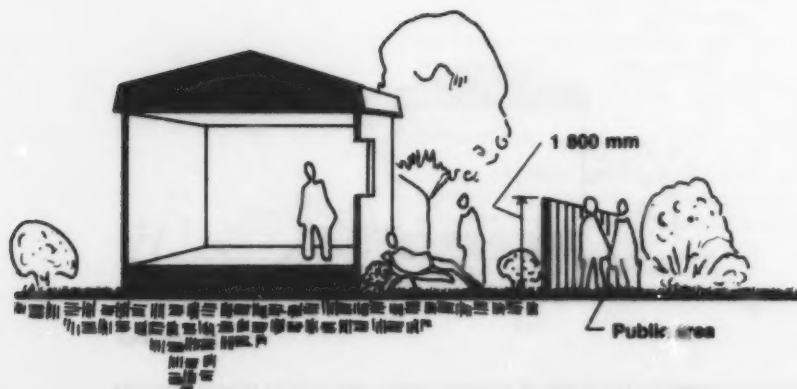
Issue

It may be impossible or inappropriate in certain instances to increase the separation space between mobile homes in existing parks. However, privacy within the unit is very important and other measures should be undertaken if improved separation space cannot be obtained.

Discussion

A screen high enough to provide privacy between facing windows in adjacent mobile homes may reduce access to views, sunlight or even adequate ventilation. Improvements to privacy may be impossible to achieve without changing the positions of the mobile homes on their lots.

The most serious privacy problems arise when there is a direct view into the mobile home from public areas.



An 1 800 mm high fence will be high enough to provide visual screening at ground level.

Design solutions

There are four basic means of improving privacy:

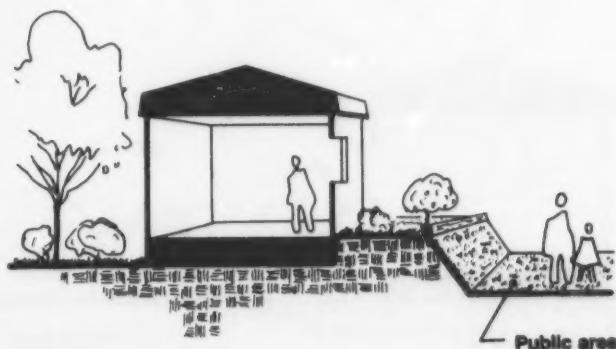
- privacy screens
- plant materials
- grade changes
- orientating windows away from overlooked areas by turning the mobile home on the lot.

These methods can be used singly or in combination.

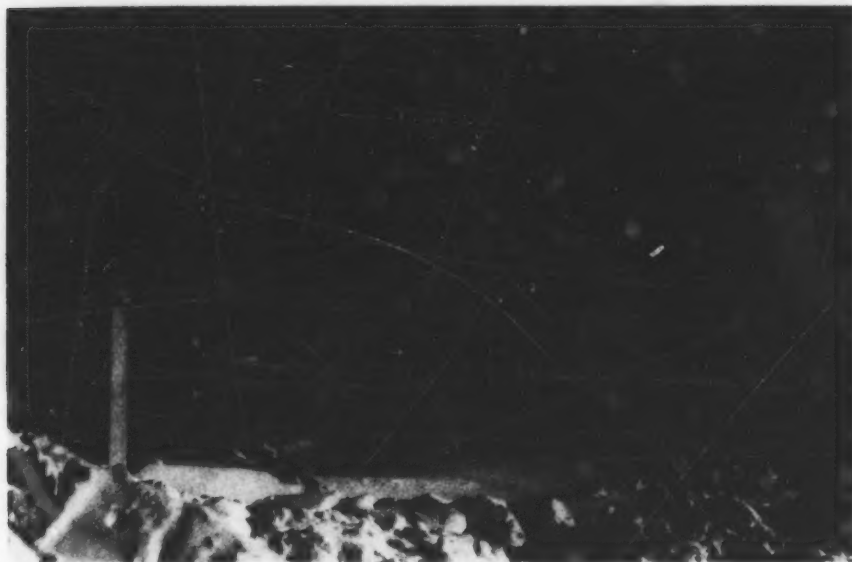
The selection of the best approach should be based on an evaluation of each individual case. It may be that none of these solutions is applicable. Reducing the number of lots to increase the separation space between units may be the only effective approach.



If there is sufficient space, plant materials can be used for screening.



Raising or lowering the grade of adjacent areas may help to reduce overlook.



A maze of overhead wiring can be both unsafe and unattractive.

4.6 Upgrading water, sewer and electrical utilities, and foundations

Issue

Basic utilities such as water supply, sewers and electricity in old mobile-home parks are often in poor condition or not up to present-day standards. One of the major problems is that good quality permanent foundations were not provided when the park was first developed.

Discussion

Utilities and foundations should be repaired and upgraded to meet current engineering practice and applicable local standards. An evaluation of the work required should be undertaken by a professional experienced in this area.

Design solutions

Except in northern areas where permafrost conditions are present, all common water and sewer systems should be placed underground.

In rural areas, individual sewage and water systems may be acceptable. Local authorities will have standards for potable water supply and waste-water treatment. Where septic tanks are used, lots must be sufficiently large so as not to create a contamination problem for neighbouring units.*

Where the lots are small, shared septic tanks can be a solution if allowed by local regulations. The number of units which can share one tank should be determined by a professional engineer.

In general, where budgets permit, underground electrical services are recommended. If poles are used they should be at the rear of the lots. Their location should be chosen carefully so that each pole serves as many mobile homes as possible. Utility poles should be kept short so as to be in scale with the mobile home. However a minimum 4 m of overhead clearance is required at all times.

The re-installation of older mobile homes on permanent foundations with good anchoring systems should be given high priority. The reinforced concrete slab-on-grade foundation is recommended.

*See CMHC *Septic Tank Standards*, NHA 5213. (Ottawa: Canada Mortgage and Housing Corporation, 1978), for details.

4.7 Removing additions and outbuildings

Issue

A common problem in older parks is the accumulation of additions and outbuildings around mobile homes. These structures are rarely built to an acceptable standard, and are often dilapidated or their appearance does not harmonize with that of the mobile home. Often they take a portion of the lot that might be better used to improve the outdoor living area.

Discussion

The amount of space allocated to additions and outbuildings should accord with the actual needs of the occupants. Outdoor storage on the lot should be limited to items of everyday use. Seasonal equipment and bulky items can be stored in a central community facility.

Design solutions

The everyday storage needs of a mobile home can be provided by a small simple structure. In some cases, a structure shared with a neighbour will reduce the amount of space required on the lot.

The use of sound materials and construction techniques is essential. The shape, design and the materials should be co-ordinated with the unit. Park management should provide plans for a standard storage structure.

It may be necessary to demolish existing structures which do not meet these rules. In some instances, rehabilitation may be possible by adding a new facing and/or changing windows and doors.



In many older mobile-home developments, the occupants have been allowed to erect additions and ancillary structures. These may have a negative impact on the privacy and amenity of neighbours where they were built without any control.



A few trees can make a big difference.

4.8 Improving site work and landscape materials

Issue

In old mobile-home parks, landscaping and site maintenance have often been neglected. In addition, the original site development work may have been inadequate, perhaps because the lots were rented for short-term periods. The result is that many older parks have an unattractive, uncared-for appearance.

Discussion

Site development for mobile homes should be undertaken to the same standard as conventional housing projects. A comprehensive plan for site maintenance and capital improvements is important. Good management practices are essential.

Design solutions

Previous sections of this document have identified the importance of site landscaping and the use of common site elements to provide a unified appearance to new mobile-home developments. Existing developments will benefit equally from the application of these principles.

One of the simplest but most effective improvements is by the planting of two or three common types of trees or shrubs throughout the development.

4.9 Management

Issue

Without good management, mobile-home parks can quickly lose their attractiveness, relations between members of the community can become difficult, and the value of the mobile homes can decline.

Discussion

In both old and new mobile-home parks, good management is the key to attractiveness and good value. The rehabilitation of old parks begins with effective management, the enforcement of park regulations, the provision of community facilities and the replacement of old obsolete units.

Design Solution

The establishment of a community centre is one of the best means to generate a sense of community identity. Members of the mobile-home park should be consulted before a decision is made on the type of centre to be provided and the facilities the residents would use.

Older parks often have units which do not meet current standards for energy efficiency. Some may be structurally unsound or be in poor condition. A policy of replacing obsolete units as they are vacated should be adopted.

Section V.

Definitions

Amenity area

Space outside the dwelling designed for the use and enjoyment of the occupants.

Ancillary structure

A structure or building not attached to, or forming part of, the mobile home.

Community amenity area

An amenity area for the common use of the occupants of a community.

CSA Z240 Certification

Official certification of units that have been manufactured in accordance with CSA Z240 series of standards for the construction of mobile homes. Compliance with CSA Z240.2.1 is required for assistance under the National Housing Act.

Habitable rooms

All rooms or spaces intended for human occupancy.

Mobile home

A factory-built dwelling designed for year-round use as a principal residence. It is constructed complete with the necessary plumbing, heating and electrical systems and designed to be transported on its own under-carriage or by other means to a prepared site. It is ready for permanent occupancy after proper installation on foundations, when it has been anchored and connected to utility services.

Mobile-home development

An area of land developed specifically for the installation of mobile homes. It is a generic term covering both mobile-home parks and mobile-home subdivisions.

Mobile-home park

A mobile-home development, not having a registered subdivision plan of lots, under single ownership managed by a mobile-home park operator. Lots, or lots with individual mobile homes already sited on them, may be rented. Ownership and responsibility for the maintenance of internal roads, underground services, communal areas and buildings, snow clearance, garbage collection and so on, together with general park management, rests with the management.

Mobile-home stand

A prepared area within a mobile-home lot upon which the unit is sited.

Mobile-home subdivision

a) Under management:

A mobile-home development registered as a subdivision, containing lots in either condominium or leasehold tenure, where the responsibility for the maintenance of streets, roads fronting lots, underground services, community areas and buildings, together with general park management may rest with the management.

b) Without management:

A mobile-home development registered as a subdivision containing lots under either freehold or leasehold tenure, where the responsibility for the maintenance of streets or roads fronting on lots rests with a municipality which may also assume responsibility for snow clearance and garbage collection.

Nonhabitable room

Rooms or space inside a housing unit that are not intended for human occupancy (i.e., closets, bathrooms, storage areas, and so on).

Outdoor living area

An outside space immediately adjacent to, and accessible from the dwelling and capable of accommodating a variety of individual outdoor activities.

Principal living-room window

The main or largest glazed area in the main living room.

Residential Standards

Document issued by the Associate Committee on the National Building Code of the National Research Council of Canada containing the requirements regulating residential construction undertaken under the National Housing Act.

Separation space

Open space provided around the unit to ensure a suitable environment for the activities undertaken within the unit.

Site Planning Criteria (NHA 5214)

The document containing the recommended site planning standards for housing eligible for National Housing Act assistance.

Skirt

The enclosure around the mobile home extending from the bottom of the unit down to grade level, that serves to hide and protect the crawl space underneath the unit.

Section VI.

Further reading

In addition to the CMHC publications referred to in the footnotes, the following books can also provide valuable additional information on the topics discussed in this Advisory Document.

National Housing Act – Minimum Property Standards for Existing Residential Buildings, (NHA 5017)
Ottawa: CMHC, 1980

New Housing and Airport Noise, (NHA 5185) Ottawa: CMHC, 1981.

Road and Rail Noise: Effects on Housing, (NHA 5156) Ottawa: CMHC, 1981.

Site Planning Criteria, (NHA 5214)
Ottawa: CMHC, 1978.

Standards for the Rehabilitation of Residential Buildings – Residential Rehabilitation Assistance Program, (NHA 5132) Ottawa: CMHC, 1977.

CMHC publications can be obtained by telephoning or visiting your local CMHC office. If not available, they can be ordered. Priced and nonpriced publications can also be ordered from CMHC National Office. Requests should be addressed to:

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Publications
CMHC National Office
Ottawa, Ontario
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